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LIEUTENANT-COLONEL, INDIAN MEDICAL SERVICE.

PRELIMINARY.

MR. PRESIDENT AND GENTLEMEN,—The operation of couching for cataract is a very ancient one and its origin is lost in the dim mists of history. Celsus performed it and described his method at the commencement of the Christian era, and the silence of the ages has since been broken at intervals of centuries by other European workers and writers. It is, however, possible that this procedure was old in the East before its first mention in the West. In India, and in other Eastern countries as well, the profession of the cataract coucher may almost be called a cult, whose art has passed down from father to son through countless generations. It is probable that the operation, as performed to-day in one of the Indian villages, is identical with that which might have been witnessed in the same district when our forefathers were naked savages. Only in a country ruled by tradition could such a state of affairs be possible. The advent of Europeans to India and the interest they took in all that concerned its peoples resulted in a close observation of the steps of the operation. This was to prove the first influence to break the settled monotonous calm it had enjoyed through the ages. As antiseptic surgery developed the progressive Western learnt to look with increasing horror on the crude and filthy methods of the coucher, with the result that within the last few decades a vigorous literature on the subject has sprung up. The principal contributors have been Brockman, Ekambaram, Hirschberg, Maynard, and Henry Smith. The lecturer has from time to time joined in the discussion, mainly from the clinical side, contributing first an analysis of 125 observed cases of the results of couching and later in 1910 of 550 such cases, in all of which very careful notes had been taken on printed schedules. To these he has since been enabled, by the kindness of Major H. Kirkpatrick, to add another 230, making the total 780. To the statistics thus obtained we shall return later.

THE TECHNIQUE OF THE OPERATION OF COUCHING.

It is important to state at the outset that there are two quite distinct operations performed by the Indian coucher. For convenience sake the lecturer would suggest that we should speak of these respectively as "the anterior" and the "posterior," using the terms relatively to the plane of the ciliary body and iris.

The anterior method.—A needle-like instrument, often a large hard thorn, with a very sharp point, is thrust suddenly through the cornea, and then onwards, either through the pupil or iris, into the periphery of the lens. No sooner is this movement complete than the next begins; using the corneal wound as a fulcrum, the operator raises his end of the instrument and thereby depresses its point, which either lies on the surface of the lens or is embedded in its substance. This movement carries the lens backward and downward, and so clears the pupil. Great stress is laid on the immediate restoration of sight, and the operator departs in a blaze of glory, which dies down all too rapidly when sepsis begins to assert itself in the eye.

The posterior operation is a much more scientific procedure. Its first step is the making of an incision in the sclera just behind the ciliary body by means of a lancet (Fig. 1), guarded with cotton-wool to prevent its being introduced too far into the globe. Through the puncture thus made a copper probe, provided with a cotton stop, is introduced, and a circular movement is given to the point with the view of breaking through the fibres of the suspensory ligament. As soon as these have been torn through, the lens is depressed by a downward stroke of the point of the instrument, which is then withdrawn.

Such are the bare outlines of the two methods.

During the performance of a c—— operation the surgeon and his patient squat upon t[illegible]throughis facing each other, in the immemorial fashion of ta[illegible]as tat, whilst an assistant, in the same attitude behind, ho[illegible]and steadies the patient's head. (Fig. 2.) The subject is rich with detail, full of living interest, which links such incidents across the centuries with the stories of Bartimæus and of the Pool of Bethesda, but inasmuch as our topic to-day is pathological we must leave this side of the question to be dealt with at another time and place.

THE RESULTS OF COUCHING.

The testimony of many reliable witnesses has established the fact that the results obtained by the coucher deserve to be described as appalling. This will be best illustrated by a few figures from the statistics of the 550 cases to which reference has already been made. In only 10·59 per cent. of these was the vision 1/3 and upward. The figures given refer in each case to the vision corrected with lenses. If every case with a vision of 1/10 and upward be ranked as a success, the coucher can claim 21·64 per cent. Again, if anything from 1/10 vision down to a finger count close to the face be counted as a partial success, the figure for this class is 16·69 per cent. This is very much more liberal treatment than would be accorded to any Western surgeon. A very significant point of interest in this connexion is that the majority of the histories are comparatively short. Against these figures we may place the statistics of the Madras Hospital so long ago as 1903, before the present system of rigid antisepsis had been introduced. Recoveries numbered 96 per cent., poor results 2 per cent., and failures 2 per cent. These figures would indicate that the coucher was losing 60 per cent. more eyes than we were. If the vast number of eyes submitted to reclination be taken into account, this 60 per cent. of avoidable loss totals up to a staggering figure. Nor must we forget that even amongst the successes the average vision obtained is greatly in favour of the Western surgeon.

The causes of failure after couching have been worked out from a clinical point of view. The figure for iritis and irido-cyclitis comes to 35·76 per cent. of the total number of cases; glaucoma accounts for 11·05 per cent.; imperfect dislocation of the lens for 8·94 per cent.; whilst minor heads make up for the rest of the failures. There can be no doubt that in a certain number of cases the couchers, owing to mistakes in diagnosis, operate in cases other than cataract: these include glaucoma, optic atrophy, retinitis, and other conditions; but it is only fair to say that, relatively speaking, such errors are very far from common.

The material before us consists of 54 globes, the great majority of which were removed in the Madras Ophthalmic Hospital in the period from 1911 to 1915, though some are of much older date. They were placed in 5 per cent. formalin immediately on removal, and were subsequently frozen and bisected. In a number of instances one half of the eye was submitted to microscopic examination after suitable sectioning. Each of the half globes and a number of microscopic specimens have been photographed and magic-lantern slides made therefrom. It will be convenient to classify our observations under a number of separate headings.

THE VARIOUS DIRECTIONS IN WHICH DISLOCATION OF THE LENS IS FOUND TO HAVE TAKEN PLACE.

Before considering this subject in the light of the pathological specimens before us, it is necessary to make certain preliminary statements.

1. Inasmuch as all our material is derived from blinded eyes, it is obvious that we are dealing with the coucher's failures alone, and are excluding his successes. In a very large percentage of the latter the lens is seen, during life, to be floating freely in the vitreous, apparently untrammelled by adhesions.

2. The position in which we find the lens on bisection of the eyeball is not necessarily that into which it was thrust at the time of operation, for the changes which occur in the eye as a result of inflammatory action may profoundly alter the position into which the lens was originally forced by the coucher. Nor must we forget that in those globes in which the cataract is not tightly tethered by adhesions gravity plays a part.

Having thus cleared the ground, we may start with the statement that, though the lens may be displaced in any direction within the sclero-corneal coat, backward dislocations

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Hunterian Lectures

ON THE

INDIAN OPERATION OF COUCHING FOR CATARACT.

Delivered before the Royal College of Surgeons of England on Feb. 19th and 21st, 1917,

BY R. H. ELLIOT, M.D. LOND., F.R.C.S. ENG.,
LIEUTENANT-COLONEL, INDIAN MEDICAL SERVICE.

PRELIMINARY.

MR. PRESIDENT AND GENTLEMEN,—The operation of couching for cataract is a very ancient one and its origin is lost in the dim mists of history. Celsus performed it and described his method at the commencement of the Christian era, and the silence of the ages has since been broken at intervals of centuries by other European workers and writers. It is, however, possible that this procedure was old in the East before its first mention in the West. In India, and in other Eastern countries as well, the profession of the cataract coucher may almost be called a cult, whose art has passed down from father to son through countless generations. It is probable that the operation, as performed to-day in one of the Indian villages, is identical with that which might have been witnessed in the same district when our forefathers were naked savages. Only in a country ruled by tradition could such a state of affairs be possible. The advent of Europeans to India and the interest they took in all that concerned its peoples resulted in a close observation of the steps of the operation. This was to prove the first influence to break the settled monotonous calm it had enjoyed through the ages. As antiseptic surgery developed the progressive Western learnt to look with increasing horror on the crude and filthy methods of the coucher, with the result that within the last few decades a vigorous literature on the subject has sprung up. The principal contributors have been Brockman, Ekambaram, Hirschberg, Maynard, and Henry Smith. The lecturer has from time to time joined in the discussion, mainly from the clinical side, contributing first an analysis of 125 observed cases of the results of couching and later in 1910 of 550 such cases, in all of which very careful notes had been taken on printed schedules. To these he has since been enabled, by the kindness of Major H. Kirkpatrick, to add another 230, making the total 780. To the statistics thus obtained we shall return later.

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The anterior method.—A needle-like instrument, often a large hard thorn, with a very sharp point, is thrust suddenly through the cornea, and then onwards, either through the pupil or iris, into the periphery of the lens. No sooner is this movement complete than the next begins; using the corneal wound as a fulcrum, the operator raises his end of the instrument and thereby depresses its point, which either lies on the surface of the lens or is embedded in its substance. This movement carries the lens backward and downward, and so clears the pupil. Great stress is laid on the immediate restoration of sight, and the operator departs in a blaze of glory, which dies down all too rapidly when sepsis begins to assert itself in the eye.

The posterior operation is a much more scientific procedure. Its first step is the making of an incision in the sclera just behind the ciliary body by means of a lancet (Fig. 1), guarded with cotton-wool to prevent its being introduced too far into the globe. Through the puncture thus made a copper probe, provided with a cotton stop, is introduced, and a circular movement is given to the point with the view of breaking through the fibres of the suspensory ligament. As soon as these have been torn through, the lens is depressed by a downward stroke of the point of the instrument, which is then withdrawn.

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The testimony of many reliable witnesses has established the fact that the results obtained by the coucher deserve to be described as appalling. This will be best illustrated by a few figures from the statistics of the 550 cases to which reference has already been made. In only 10·59 per cent. of these was the vision 1/3 and upward. The figures given refer in each case to the vision corrected with lenses. If every case with a vision of 1/10 and upward be ranked as a success, the coucher can claim 21·64 per cent. Again, if anything from 1/10 vision down to a finger count close to the face be counted as a partial success, the figure for this class is 16·69 per cent. This is very much more liberal treatment than would be accorded to any Western surgeon. A very significant point of interest in this connexion is that the majority of the histories are comparatively short. Against these figures we may place the statistics of the Madras Hospital so long ago as 1903, before the present system of rigid antisepsis had been introduced. Recoveries numbered 96 per cent., poor results 2 per cent., and failures 2 per cent. These figures would indicate that the coucher was losing 60 per cent. more eyes than we were. If the vast number of eyes submitted to reclination be taken into account, this 60 per cent. of avoidable loss totals up to a staggering figure. Nor must we forget that even amongst the successes the average vision obtained is greatly in favour of the Western surgeon.

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Before considering this subject in the light of the pathological specimens before us, it is necessary to make certain preliminary statements.

1. Inasmuch as all our material is derived from blinded eyes, it is obvious that we are dealing with the coucher's failures alone, and are excluding his successes. In a very large percentage of the latter the lens is seen, during life, to be floating freely in the vitreous, apparently untrammelled by adhesions.

2. The position in which we find the lens on bisection of the eyeball is not necessarily that into which it was thrust at the time of operation, for the changes which occur in the eye as a result of inflammatory action may profoundly alter the position into which the lens was originally forced by the coucher. Nor must we forget that in those globes in which the cataract is not tightly tethered by adhesions gravity plays a part.

Having thus cleared the ground, we may start with the statement that, though the lens may be displaced in any direction within the sclero-corneal coat, backward dislocations

are by far the mo ...mon, whilst forward ones were only found 4 times i... whole series of 54 globes. None the less, each of th ...es possesses considerable interest.

Forward Dislocations.

(i.) In No. 8 the couching instrument passed through the limbus, and the track of the wound can be plainly followed in microscopic sections. The ciliary body was pushed bodily away from the sclera, and the lens nucleus was forcibly thrust into the space formed by this cyclo-dialysis (Fig. 3); it is to be seen embedded in a dense mass of inflammatory exudate, whilst its capsule, with some of the cortex, lies in the normal situation.

(ii.) In No. 44 the capsule and the nucleus of a Morgagnian cataract are seen floating in the vitreous chamber. During life the nucleus frequently passed backwards and forwards between the aqueous and vitreous cavities. The same phenomenon, though rare, has been observed in other couched eyes.

(iii.) No. 61 is probably an instance of the same kind of thing having happened at an earlier period. (Fig. 4.) Now, however, the small dark Morgagnian nucleus is seen fixed in the lower part of the anterior chamber, into which it doubtless gravitated by its own weight, and there set up inflammatory mischief, which led to its adhesion to the surrounding parts, and to its becoming fixed *in situ* by the formation of organising exudate.

(iv.) In No. 108 the only evidence of lens material present was the capsule of a Morgagnian cataract, which lay impacted in the lower part of he anterior chamber. (Fig. 5.) On section, Morgagnian fluid escaped, and no trace of a nucleus could be detected. It is of interest to record that the writer has, on a number of occasions, operated on Morgagnian cataracts, in which the lens nucleus had been reduced to the thickness of a lamellar disc, or in which no trace of a nucleus could be detected. In this case no adhesions had formed, and during the transit of the specimen to England the capsule fell from its position to the bottom of the bottle.

Backward Dislocations.

Dislocations backward are the rule, and very wide variations are found both in the completeness and in the direction of the displacement.

Those in which the *lenses*, or their nuclei, have been *completely dislocated into the vitreous, and there lie floating* more or less freely (Fig. 6) are 9 in number. In 7 of them the cataracts were Morgagnian, and in the 2 others there was a bulky nucleus with a thin covering of stiff cortex. In 7 the tension of the globe was high; in 6 the retina was completely or nearly completely detached, and in 2 of them it was so much folded as to limit the movements of the lens.

From a consideration of the lenses found floating in the vitreous, we turn to that of those which were *entangled in a more or less consistent inflammatory exudate occupying the vitreous chamber.* (Fig. 7.) During life such lenses were reported to be fixed or nearly so. In the specimens they are seen to be nested in a mass of exudate, which holds them imprisoned against the ciliary body and the back of the iris. Usually this exudate is limited in quantity, and is confined to the anterior portion of the eye, and principally to the neighbourhood of the dislocated lens. More rarely it is very abundant, and occupies a large part or even the whole of the vitreous chamber. (Fig. 8.) We shall deal with this exudate more fully at a later stage; for the present it suffices to state that it is inflammatory in origin, and that it contains a large number of cells. Of the 6 cases which form this group, 3 were Morgagnian cataracts; 5 were certainly dislocated in their capsule, the sixth is hidden in such dense exudate that it cannot be clearly seen. It is desirable to make it clear that intermediate forms are found between this group and the previous one. In other words, there is no hard-and-fast line between the cases in which the lenses float freely in the vitreous and those in which they are, to a greater or less degree, tethered by the pathological thickening of the hyaloid body.

We have next to consider a group of 10 eyeballs, in each of which the dislocated *cataract was firmly fixed to the ciliary body and to the back of the iris by definitely organised fibrous tissue.* (Fig. 9.) These globes present certain well-marked features of some interest. 1. The percentage of Morgagnian cataract is much lower than that in the preceding groups, and corresponds closely with the normal frequency of this form of cataract in Indian practice. 2. The cataract was dislocated *in its capsule* in no less than 8 of the 10 cases. 3. The retina was totally detached in 2 and very extensively so in 1; in every one of the remaining 7 this membrane showed the presence of white dots, apparently on its surface. 4. The time which had elapsed since operation in the cases falling under this group is remarkable. In one it is given as 7 months; in 2 others there is no history; in the remaining 7 the duration was from 2 to 20 years, with an average of well over 7 years. The association of the presence of white dots with these long histories is remarkable and will be taken up in a later section.

No. 99 (Fig. 10) is a specimen of special interest for two reasons—viz. (1) the cataract is fixed to the globe unusually far back, being attached to the retina a little behind the equator of the eye; (2) the dislocation has taken place in an upward direction, and therefore against the action of gravity. From time to time we meet clinically with a couched lens whose suspensory ligament, though torn through over a wide circumference, has been spared at one part, which acts as a hinge. The loosened lens flaps backwards and forwards with the movements of the eye, at times obstructing the pupil and at others being lost to sight. If the hinge is above the cataract usually blocks the pupil when the head is erect; but one meets with cases in which the lens floats up out of the way unless the face is thrown forward into the horizontal plane; this is apparently due to a check-ligament action of the remaining suspensory fibres of the lens. Should inflammation be set up in such an eye and the lens become involved in the exudate it will become fixed, as in this case, in the upper segment of the globe.

When we come to speak of the changes found in the vitreous we shall have occasion to refer to the frequency with which the hyaloid body is represented by a shrunken cone with its apex at the optic nerve and its base in the neighbourhood of the ora serrata. This form, which is well known to pathologists, is due to the anatomical attachments of the vitreous body, and to the fact that the latter undergoes shrinkage after being thickened and opacified by the presence of inflammatory exudate. In studying the present collection one cannot fail to be struck with the fact that the exudate, which fixes, or help to fix, the lens in its pathologic position, is one with, and part of, this cone-shaped new formation. Before leaving the consideration of this group we must once again point out that no hard-and-fast line separates it from the preceding one, and that intermediate links between the two can easily be pointed to.

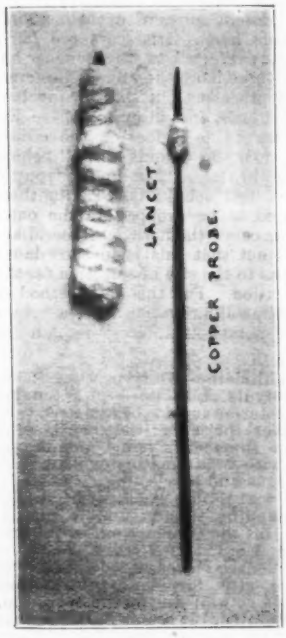
In 11 globes, *dislocated cataracts were found matted between the iris and ciliary body in front and the completely detached retina behind.* It is very difficult to say what the nature of the original cataracts was, since all that one can now find is a nucleus, usually rather dark-coloured, embedded in a mass of inflammatory tissue. (Fig. 11.) These nuclei are undergoing steady reduction in bulk as the result of phagocytic action. In 7 of the 11, the lens remnants lie either within the complete capsule, or in its near neighbourhood. The interior of the capsule is usually found to have been invaded by the mass of inflammatory and organising tissue which mats together all the structures (i.e., the iris, the ciliary body, the remains of the lens and the detached retina), and which occludes the angle of the anterior chamber. The completeness of the dislocation varies greatly. In some cases the lens is hardly moved from its usual position, and lies in front of the anterior hyaloid membrane, whilst in others it is displaced into the vitreous cavity. In one instance the detachment of the retina and the inflammatory changes are sharply limited to the lateral half of the eye towards which the cataract was dislocated, but this case belongs more to the next group than to the one we are now discussing

There are three outstanding and very important features common to these cases: (1) in the great majority of them there is evidence that the operation was followed by severe irido-cyclitis; (2) 9 of the 11 were shrinking eyes with low tension; and (3) the time which had intervened between the couching and the enucleation was between one and two years in every case save one, in which it is probable that the furnished statement of three months was inaccurate. It will be noticed that the histories are much shorter than those in the previous group. This, together with the other two points mentioned indicates that we have to deal with a condition widely different from that in any of the previous groups. Here the inflammatory process had been induced by a septic infection of the eyes of a decidedly more virulent character, though it fell short of that acme of infectivity,

which leads in so many cases of the Indian operation to pan-ophthalmitis and destruction of the globe within a few weeks.

We come next to a group of 5 cases, which have one feature in common—viz., that the cataract, though *dislocated backwards, lies distinctly in front of the anterior hyaloid membrane*, and therefore outside the vitreous cavity. (Fig. 12.) In 3 of them the solid parts of the lenses have been pushed back from their original position in such a way that they act like wedges, forcibly keeping the anterior hyaloid membrane in a plane posterior to that which it would normally occupy. Out of these 5 cataracts 4 were cortico-nuclear; the fifth was too much altered for it to be possible to state what its nature was. In certainly 4 out of the 5 moderately severe irido-cyclitis had followed the couching, but the exudative process was a much less severe one than that which characterised the specimens of the previous group. The consequence was that there was no such matting of all the parts concerned as is there seen. In every case the detachment of the retina was complete or nearly so, but in not one was the lens enwrapped in its folds. This we may attribute to two causes: (1) a merely contributory one, that the vitreous cavity was not invaded, and (2) that the infection was less virulent and the inflammation consequently less severe than in the members of the previous group.

FIG. 1.



Instruments used in couching.

There is a small group of 3 cases in which the remains of the lens lie *in situ* in the periphery of the capsule, whilst the central portion has disappeared. These resemble the peripheral after-cataracts not infrequently seen following the extraction of a not fully mature lens.

In conclusion, we have to mention two specimens in which the condition found was so unusual that it would scarcely have been possible to have anticipated its occurrence.

The first of these was one of the earliest globes sectioned. A Morgagnian lens, entire in its capsule, was found *thrust behind the retina*. It lay against the scleral coat close to the ciliary body; it had detached the retina over a large area in the neighbourhood of the ora serrata, and had led to a complete separation of it on that (the nasal) half of the eye. The edge of the detached retina had contracted adhesions to the front of the lens capsule and was much puckered in that neighbourhood, doubtless as the result of cicatrisation.

The second specimen (Fig. 13) shows many features in common with the last. The lens is entire in its capsule and is almost certainly Morgagnian; the tear in the retina through which it was thrust has now cicatrised up, leaving a puckered scar. The retina is totally detached, and on section the cataract lay as far forward as the separation of that membrane would permit. The pupil was blocked by exudate, and atrophic scars in the iris showed that there had been extensive laceration of that membrane. The globe was removed a year after operation.

The sequence of events in these two cases was probably as follows. The posterior operation must have been adopted and the incision placed far back; a wide tear in the retina resulted; the lens, completely separated from its attachments, was kept entire by the toughness of the Morgagnian capsule, whilst the fluidity of its contents made its insinuation through the retinal tear an easy matter. The fact that a case has recently been recorded in which, in a boy of 17, the lens spontaneously escaped through a 2 mm. trephine hole, throws a sidelight on such cases as these.

ACCIDENTAL INJURIES TO OTHER STRUCTURES THAN THE LENS DURING COUCHING.

Though the primary object of the Indian cataract coucher is to depress the lens, he may accidentally injure any or all of the other structures of the eye. Evidence of such damage is obtained both clinically and pathologically.

The Cornea.

Opaque scars on the cornea are quite frequently seen in the out-patient room in eyes which have been subjected to the anterior operation, but are rendered invisible in formalin-mounted specimens owing to the opacification of the membrane. Other evidence of corneal injury is, however, available.

In No. 9 a corneal fistula is present, lying to the inner side of the centre of the eye. (Fig. 14.) The lamellæ immediately surrounding it are largely replaced by connective tissue; the whole thickness of the membrane is markedly reduced, and the lining epithelium is irregular and vacuolated. The iris is very closely adherent to the back of the cornea near the fistula, but more loosely attached further out. There has evidently been some ulceration of the cornea and the formation of a limited staphyloma, which burst at a later date, leaving the fistula now seen. It is probable that the point of fistulisation was determined by the use of a septic instrument at the time of operation, and that septic keratitis followed, leading to early perforation with entanglement of the iris. On the other hand, it is possible that the *enclavement* of the iris occurred as the instrument was withdrawn. In either case, the later sequence of events included the formation of a staphyloma, a secondary rise in tension, and a fresh perforation at the weakest point, resulting in the production of a permanent fistula.

FIG. 2.

The operation of couching.

In No. 45 the lens capsule is adherent to the back of the cornea, the iris being widely torn and being probably also involved in the synechia. (Fig. 15.) All that remains of the lens is a brown nucleus; the cataract was evidently Morgagnian. It is probable that after the escape of the fluid it contained the lax capsule prolapsed into the wound, either with the gush of fluid which accompanied the withdrawal of the instrument or at a later date.

In No. 116 it is the retina which is impacted in the corneal wound. (Fig. 16.) It seems likely that in this instance the sequence of events was as follows. A severe plastic inflammation resulted from the couching, and involved among other structures a capsular synechia, which had formed at the time of operation or soon after. The vitreous became heavily infected, and the consequent exudate became adherent, on the one hand, to the retina, which thereby underwent total detachment, and on the other to the capsule and its synechia. The progressive contraction of the scar

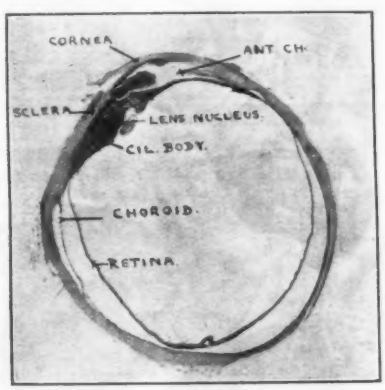
tissue then drew the retina into the wound. This would appear to be the most likely explanation, but it is not impossible, in dealing with such an operation as couching, that the retinal detachment was very extensive, and that the injury inflicted provided a path along which a direct prolapse of the retina may have occurred.

The Sclera.

A very large number of Indian cataract-couchers perform the posterior operation, and therefore make their preliminary incision in the sclera outside the limbus. Dr. Ekambaram, who has watched these men at work, believes that they deliberately endeavour to avoid the ciliary body, and it also looks as if some of them purposely place their incision below the external rectus muscle. Like his Western *confrère*, the Indian surgeon does not always succeed in placing his incision just where he wishes to; this is not surprising, as many of them work without any local anæsthetic, and not a few of their patients are nervous and unruly to the last degree. Moreover, it is more than probable that there are different opinions amongst couchers as to the best site for the preliminary cut. These considerations will serve to explain the variety of location of the scars, as found in the specimens before us; indeed, some such explanation is called for, since the cicatrices may be found as far forward as the limbus and as far back as the equator of the globe; what is more, they may be seen in the present collection, not only in their common situation, on or near the horizontal meridian, but in any of the quadrants of the eye.

As a rule, the evidence of injury to the sclera is to be inferred from the interference with the parts beneath that coat, and such instances will be taken up when we come to consider the lesions of the ciliary body and choroid; but occasionally we have been fortunate enough to hit off the scleral scar either in the original division of the globe or during the course of sectioning of part of it for the purpose of microscopic examination.

FIG. 3.



Lens dislocated between c. b. and sclera. (8.)

In No. 306 the track of the original wound can be seen as a pigmented scar in the sclera immediately behind the line of the ciliary processes. Microscopic sections show: (1) that the pigmentation of the deeper part of the scar is due to the impaction of uveal tissue in its depth; (2) that there is a fistulous scar running right through the thickness of the sclera; and (3) that the subconjunctival tissue in the neighbourhood of the wound is permeated by large open spaces lined with endothelium. (Fig. 17.) It is clear that a limited measure of filtration had been established, but this apparently proved insufficient to keep the tension of the eye from rising, as is shown by the deep glaucomatous cupping and by the obliteration of the anterior chamber.

No. 43 shows a scar a little farther back, in the neighbourhood of the ora serrata; but in this case the wound appears to have healed solidly. The pigment of the underlying uveal tissue shows a marked disturbance, whilst before the specimen was cut it was observed that the sclera was pigmented in the neighbourhood of the cicatrix.

In No. 8 the wound lay in the limbus, and the solidifying scar can be traced right through the thickness of the ocular tunic and down to the mass of inflammatory exudate which surrounds the dislocated lens, and fills the angle of the anterior chamber. Here, again, the uveal pigment can be traced some distance up into the scar, in which it is distinctly entangled.

The Uveal Tract.

In quite a large number of couched eyes one can see, during life, evidence of past injury to the iris in the form of more or less extensive scars, many of which probably also involve the ciliary body. Moreover, in other cases, one can infer the presence of injury to the ciliary body and the choroid from the existence of pigmented cicatrices in the sclera. Anatomically, the present series of eyeballs affords additional information on this head. Iris scars are fairly common. In one case, already referred to, the coucher has effected a cyclo-dialysis; in three more the wounds lie across the front parts of the ciliary processes; in six they involved the region of the orbiculus ciliaris, and in one of these the scar lies as much on the choroid as it does on the ciliary body (*vide* Fig. 7); lastly, in four the wounds lie well behind the ciliary body, being placed in two of them just in front of the equator and in two more well behind it. Taking them as a whole, the wounds tend to be grouped in the outer quadrant of the eye, above or below the horizontal meridian. It has already been pointed out that this is in accordance with Ekambaram's evidence as to the site of selection for the incision in the posterior operation. Far the best method of examining these scars is by transillumination with a bright light from behind. Some points of interest remain for consideration.

In No. 44 the wound lay behind the ciliary processes; the instrument, or more probably its point, tore off a tongue-shaped process from the posterior surface of the iris, thus thinning that membrane over this area; the torn portion contracted an adhesion to the subjacent hyaloid membrane, which was itself infiltrated with inflammatory exudate; the appearance presented is curious and interesting.

In several of the globes scar-tissue radiates from the wound area into the surrounding tissues, and is then a strong contributory factor in the production of retinal detachment. In one globe (No. 130) two scars are to be seen, one of which was evidently placed too far back by mistake (Fig. 18); the eye also furnishes contributory evidence that things did not go well during the operation, for the iris is very widely lacerated. It seems probable that the patient was refractory or the surgeon unskilful. In any case it is clear that the instrument was introduced a second time.

In No. 148 a caseating mass in the eyeball (Fig. 19), lying behind the equator, was found to contain a fragment of metal; the latter was most unfortunately lost at the time the section was cut, but it was presumably the tip of the couching instrument, and its presence, taken with the facts that the wound was placed very far back and that dislocation of the lens was not effected by the operation, would seem to indicate that the patient moved violently and that the operator failed in his purpose. The strong, but strictly localised, inflammation excited suggests that the metallic fragment was of copper, and this is in accordance with the known facts of the case, since the probes used by these men to displace the lens are made of that metal.

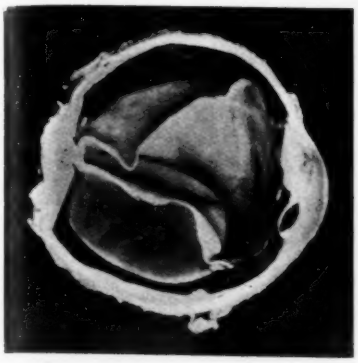
No. 72 is also a specimen of special interest. Here, too, the puncture lay behind the equator, and there seems to have been some difficulty in penetrating the choroidal and retinal coats which were carried in front of the instrument, the result being a wide separation of these two tunics from their scleral bed. (Fig. 20.)

No. 297, removed six weeks after the operation, is an eyeball which had undergone pan-ophthalmitis and had burst through a point in the sclera on the horizontal meridian somewhere in front of the equator. It is probable that a septic wound of entrance determined the site of the bursting. The lecturer has seen suppurating globes in which the sclera at one point had completely sloughed, the intense inflammation present bearing witness to the violence of the infective process.

Uveitis.

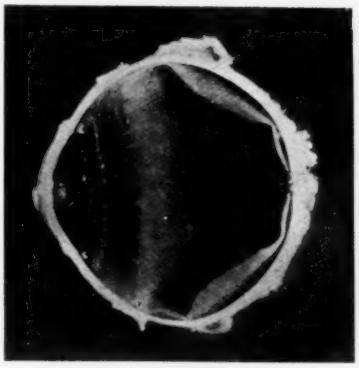
The type of inflammation of the uvea found in these specimens was plastic and was mostly confined to the iris and ciliary body. The intensity of the inflammation varied very greatly. In a number of specimens the evidence of inflammatory action was either absent or only to be detected on very careful examination. On the other hand, a large number of cases present themselves at Indian hospitals in which suppurative pan-ophthalmitis has followed the operation of couching. In Madras such globes were eviscerated, as it was considered dangerous to enucleate them, and much interesting material has thus been lost. All the intermediate stages between the very slight and the very severe

FIG. 4.



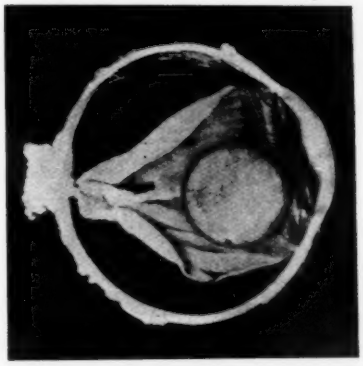
Left eye, temporal half. (61.)

FIG. 5.



Right eye, nasal half. (108.)

FIG. 6.

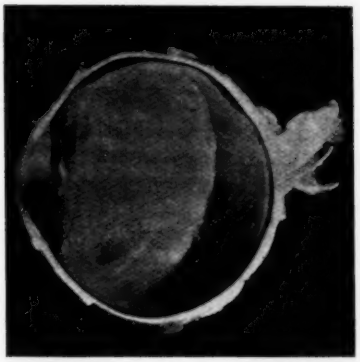


(50.)

FIG. 7.

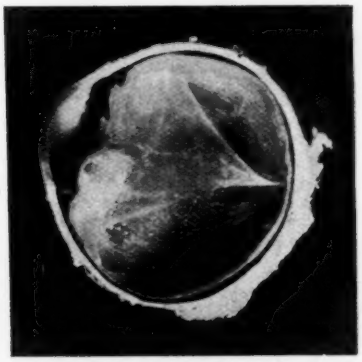
Left eye, upper half. (136.)

FIG. 8.



Left eye, lower half. (197.)

FIG. 9.

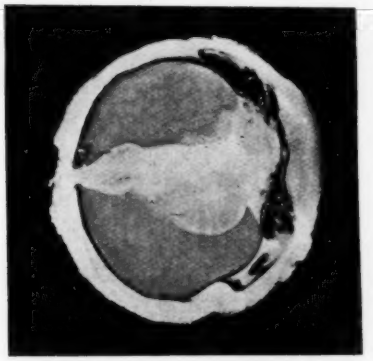


Left eye, lower half.

FIG. 10.

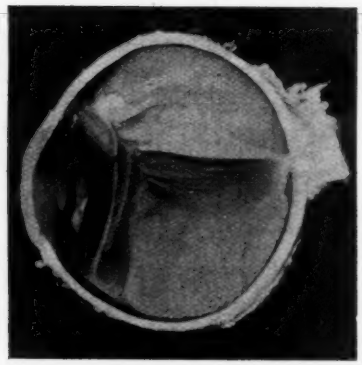
Left eye, upper half. (99.)

FIG. 11.



Left eye, upper half. (171.)

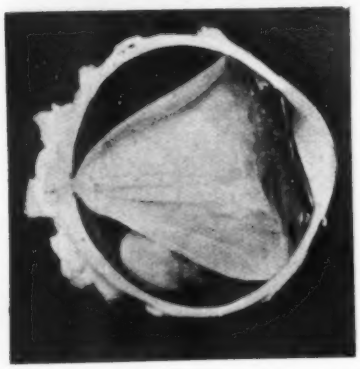
FIG. 12.



Right eye, upper half. (119.)

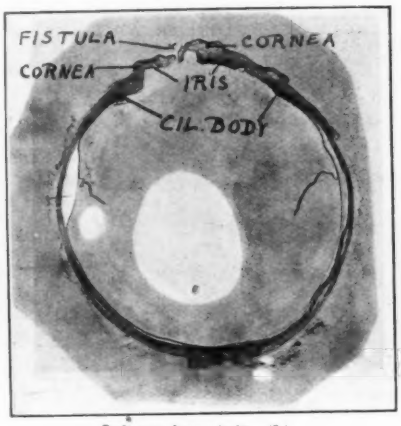
inflammations can be traced in the specimens before us. This is in accordance with what we should have expected in what was practically a series of inoculations of healthy globes with pathological materials, which varied enormously in their nature and in the quantity introduced. Nor must we forget the great differences in the ages and in the conditions of health of the patients. The plastic mass poured out from the ciliary body and iris had in many cases enveloped the remains of the lenses (Fig. 21), which can be seen in process of disintegration under the action of phagocytosis or of fluid absorption. Evidence of calcification of the lens was obtained in at least one specimen, and the same process was also found at work in the uveal coat of several others. The rupture of the lens capsule has provided a ready path of ingress for the inflammatory exudate, which can be seen filling the cavity of the capsule as well as surrounding it; the curly remains, both of the anterior and of the posterior portions of the capsule, can be clearly traced in many of the specimens embedded in dense masses of organising inflammatory exudate. In several such the

FIG. 13.



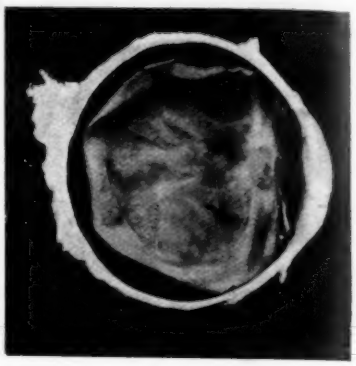
Right eye, lower half. (138.)

FIG. 14.



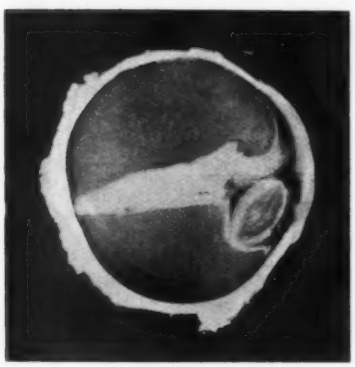
Left eye, lower half. (9.)

FIG. 15.



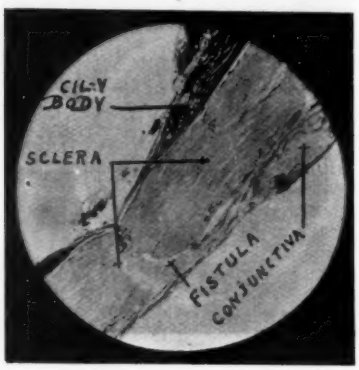
Right eye, lower half. (45.)

FIG. 16.



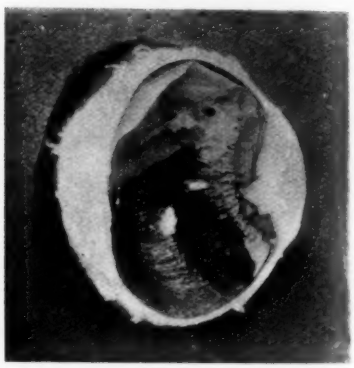
Right eye, nasal half. (116.)

FIG. 17.



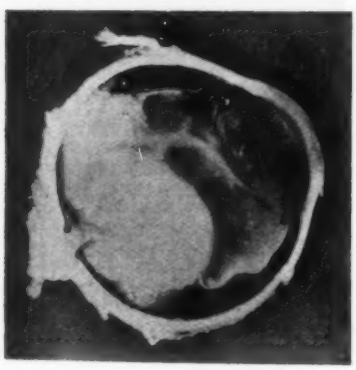
Fistulous scar in sclera. (336.)

FIG. 18.



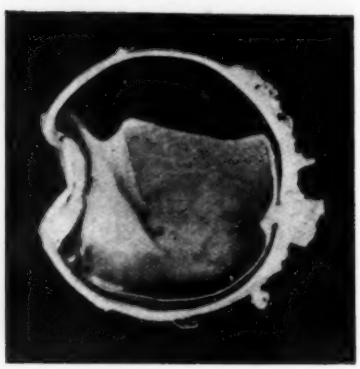
Left eye, upper half. (130.)

FIG. 19.



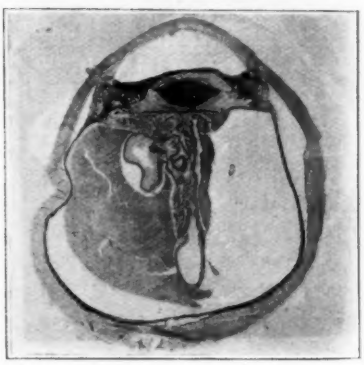
Upper half, left eye. (148.)

FIG. 20.



Right eye, lower half. (72.)

FIG. 21.



Left eye, upper half. (171.)

absence of the capsule opposite, or to one side of the pupillary area, and the curled-up ends of the elastic membrane, mark the spot where rupture was effected at the time of operation.

In only one instance has any evidence of proliferative uveitis come to light, and in this one the nodule in the iris consists of mononuclear lymphocytes; epithelioid and giant cells are conspicuous by their absence. The interest of this observation centres in the fact that a large number of these globes were removed with the object of guarding against the occurrence of sympathetic ophthalmia or of making safer the performance of an extraction in the opposite eye. So far as the first indication is concerned it would appear that the danger of sympathetic mischief in the second eye after couching is not great. The deduction thus drawn from pathological data is confirmed by the lecturer's clinical experience, for, as far as his observations go, it is extremely rare to see the second eye lost by sympathetic ophthalmia after this operation.

(To be concluded.)

THE TREATMENT OF SEPTIC WOUNDS WITH BISMUTH-IODOFORM-PARAFFIN PASTE.

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With an Account of the BACTERIOLOGICAL AND CHEMICAL ACTION OF BISMUTH-IODOFORM-PARAFFIN PASTE, *by* HELEN CHAMBERS *and* J. N. GOLDSMITH, M.Sc., Ph.D.

(*Reports to the Medical Research Committee.*)

OPINIONS still differ as to the best means of combating bacterial infection of wounds. At the present time two methods commonly used in military hospitals are those of Dr. Carrel and Sir Almroth Wright, and in both of these continuous treatment is required if satisfactory results are to be obtained.

The ideal method is to maintain continuous inhibition of bacterial growth in the wound with the least possible disturbance of the tissues and the patient. In June of last year Professor Rutherford Morison informed us of the excellent results which he was obtaining at the Northumberland War Hospital from the use of a paste composed of bismuth subnitrate, iodoform, and liquid paraffin. He kindly gave us the details of his treatment.

The bismuth-iodoform paste has been used extensively in our wards, and we have records of over 400 cases so treated; the results of 62 of these cases are given in Table I. These results are incomparably better than those of the previous year, when we were using eusol, hypertonic saline, with continuous irrigation or frequent dressings.

The composition of the paste is as follows: iodoform 2 ounces, bismuth subnitrate 1 ounce, and liquid paraffin q.s. Any consistency may be made, but the most useful are those of soft butter and thick cream. We have followed the method of treatment recommended by Professor Rutherford Morison in THE LANCET of August 12th, 1916. The patient is put under an anæsthetic, all gangrenous and necrosed tissue is cut away, and the wound thoroughly cleansed; it is swabbed out with rectified spirit, and then a small portion of the paste is vigorously rubbed into the tissues, a little being left in the bottom of the wound, which in many cases is closed with interrupted stitches, and dressed with gauze wrung out in spirit. No further dressing is required for 7 to 14 days. The work in a surgical ward is much reduced when patients do not require daily dressings, and it is a great advantage to the cases if painful and disturbing manipulation can be avoided.

Observation shows that (*a*) the paste maintains a continuous antiseptic action in the wound; (*b*) it acts as a lymphagogue, and a free exudation of serum washes the wound from within outwards; (*c*) it does not prevent the escape of discharge; (*d*) granulation tissue grows freely in contact with it; (*e*) drainage-tubes and gauze drains are unnecessary; (*f*) septic wounds heal nearly as rapidly as non-infected ones; (*g*) bone union is rapid and the tendency to form sequestra is slight.

Both the constituents of the paste are toxic if absorbed freely. Only one case of such absorption has occurred; it is discussed later. Acting on the recent advice of Professor Morison, the quantity of paste now used rarely exceeds 2 drachms; with this amount the risk of toxic absorption is negligible.

The details of a large number of severe wounds treated with bismuth-iodoform-paraffin paste have been collected and summarised. In order to obtain a true conception of the results the cases have not been selected for their rate of progress; they include all the cases treated by this method wounded during July, August, and September, 1916.

To decide the progress of the cases the data given are: (1) The duration of the febrile period; (2) the length of time before healing; (3) for cases complicated with bone injury, the persistence of sinuses, and the formation of sequestra. For a comparison of results the first two are open to objection, since many septic wounds are afebrile and the time taken to heal varies enormously, depending largely on the extent of surface injury and the rapidity with which a plastic operation can be done. The third is the most valuable, and the cases complicated with fractured bones have therefore been grouped together. Table I. is a detailed list of 62 cases of compound fractures which had left hospital before Nov. 30th, 1916. Similar tables have been made for the 35 cases of compound fracture still under treatment after this date, and for the wounds not complicated with bone injury.

Summary of Results.

The total number of compound fractures quoted is 97, the average febrile period was 10 days, and 51·75 per cent. of them were completely healed within 2½ months of being wounded. An analysis of the 62 completed cases in Table I. shows that 50 have healed, only 4 have sinuses, and 8 have superficial wounds.

The 35 incompleted cases have an average febrile period of 15·65 days and the average time since wounding was 87·85 days; 14 of these have superficial wounds only. All the cases not complicated with bone injury had healed by Nov. 30th, with the exception of 4. The average febrile period of 40 of the severest of these cases was 3·35 days, and the time in hospital 42 days.

It is an advantage to cases of compound fracture that the wound can be left undisturbed for periods of 7 to 21 days and that drainage-tubes are not required. This is important, as macerated specimens of fractured bones from cases treated with continuous irrigation have shown apertures through the bone directly due to the drainage-tubes and not to the original injury. The best results are obtained when B.I.P.P. treatment is applied soon after the man has been wounded. If partial necrosis of bone has occurred before the case has been admitted the formation of a sequestrum is unavoidable, but it is found that after it has separated one operation is usually enough to effect complete healing.

Six cases complicated with suppurating joints have required amputation after being treated with the paste, and these might be looked upon as failures. In all these cases extensive infection had occurred before they came under this treatment. Post-operative examination of the amputated limbs showed that sepsis had subsided in the area to which the paste had been applied, but that the infection had spread extensively, and the paste had not reached the whole of the infected area. For example, in a case of severe gunshot wound of the hand, pus had tracked among the carpal bones and along the tendon sheaths of the forearm.

In a total of 400 only one case of secondary hæmorrhage occurred. This patient had a deep wound of the buttock, which was nearly healed. He had been up and moving about for three weeks when an aneurysm of the gluteal artery ruptured, necessitating the ligature of the internal iliac artery.

No case of gas gangrene or tetanus has developed in our wards since B.I.P.P. treatment was begun, although many of the wounds have grown anaerobes and some of them the tetanus bacillus. The data available here are not sufficient to decide whether this result is in any way due to the B.I.P.P., or whether it is entirely due to the antitetanus serum which every patient receives.

One case of iodoform poisoning occurred when the treatment was first begun and when larger quantities of paste were used; it was characterised by fever, emaciation, and delirium. The symptoms subsided when the treatment was discontinued. Several cases of "blue gum" have been observed, but we are not satisfied that these are attributable to bismuth absorption.

In conclusion, the principles which underlie this method of treatment and that of Carrel and Dakin may be compared. In the latter a very powerful antiseptic agent of high solubility is employed, but the effect is so transitory that it is necessary to renew it at short intervals. Professor Morison employs a less powerful antiseptic and one which is of feeble solubility, but which is able to keep up a continuous action in the depths of the wound without requiring to be renewed for days or even weeks.

The improvement in our results with this treatment encourages us to believe that it is along this line that progress will be made in future.

TABLE I.—SIXTY-TWO CASES OF GUNSHOT WOUND COMPLICATED WITH

No.	Index No.	Nature of injury and condition on admission.	Treatment.	Day of disease admitted.	Day of disease B.I.P.P. treatment began.	No. of days febrile since admission.	No. of days after injury when healed or transferred.	Remarks.
1	44	G.S.W. head, large cerebral hernia 2 in. diam., projecting 1 in. Trephined before admission.	No operation. 52 days after admission B.I.P.P. applied to hernia. Before this it had slightly increased.	14	66	0	117	21 days after B.I.P.P. was applied hernia had disappeared.
2	175	Penetrating G.S.W. neck. Fractured cervical vertebra, œsophagus and L. brachial plexus injured. Admitted with suppurating sinus of neck.	28 days after admission operation sinus curetted. 75 days after admission 2nd operation. Loose piece of bone from front of 4th cervical vertebra removed. B.I.P.P. inserted into cavity in front of spine. Wound stitched.	44	119	25	140	Healed.
3	72	G.S.W. R. chest, C.Fr. scapula, 6th and 7th ribs. C.C.Fr. ulna.	8 days after admission operation, F.B. removed from arm. Wounds cleaned, B.I.P.P. inserted.	5	13	5	43	All wounds healed. Later discharged light duty.
4	108	G.S.W. shoulder, C.Fr. scapula, V.S.W.	31 days after admission B.I.P.P. inserted.	3	34	37	79	Auxiliary hospital.
5	178	G.S.W. L. shoulder, C.C.Fr. scapula, L.S.W., F.B.	3 days after admission operation, cleaning, many loose pieces of bone removed, B.I.P.P. inserted.	3	6	2	46	Healed.
6	60	C.Fr. scapula.	2 days after admission B.I.P.P. inserted.	6	8	0	24	Healed. Later discharged full duty.
7	150	C.C.Fr. clavicle and scapula. L.W. open, subclavian vessels exposed.	2 days after admission operation, B.I.P.P. inserted.	6	8	2	92	A.H. Wound not healed. Sequestrum.
8	41	C.Fr. humerus, near elbow, involving joint. Very severe.	1 day after admission operation, wound cleaned, B.I.P.P. inserted.	3	4	1	32	Healed.
9	78	C.Fr. humerus, radius and ulna. Bones of elbow-joint completely blown away.	1 day after admission operation, wound cleaned, sloughs removed, B.I.P.P. inserted.	6	7	17	82	,,
10	75	G.S.W. L. shoulder, penetrating wound, S.B.I. surgical neck of humerus.	3 days after admission operation, cleaning, loose pieces of bone removed, B.I.P.P. inserted.	5	8	6	35	Healed. Discharged to duty.
11	142	C.C.Fr. humerus and spine of scapula. Head of humerus removed before admission, V.S.W.	1 day after admission operation, tubes removed, B.I.P.P. inserted.	14	15	21	65	Transferred; almost healed, no sinus. Superficial wound only.
12	147	G.S.W. elbow-joint, C.C.Fr. all bones, V.S.W.	16 days after admission operation, abscess opened, 2 loose pieces of bone removed, B.I.P.P. inserted.	4	20	28	98	Healed.
13	148	C.C.Fr. humerus, lower end. Dislocation of elbow-joint, V.S.W.	5 days after admission B.I.P.P. inserted. 13 days after admission operation, lower end of humerus removed.	23	28	16	123	,,
14	3	C.Fr. humerus, lower end.	1 day after admission operation, cleaning, 2 pieces of shrapnel removed, B.I.P.P. inserted.	3	4	18	49	Healed. Later discharged light duty.
15	46	C.Fr. humerus near elbow-joint, V.S.W.	10 days after admission operation, incisions, wound cleaned, B.I.P.P. inserted.	5	15	23	45	Healed. Later discharged full duty.
16	84	C.C.Fr. humerus mid-shaft.	1 day after admission operation, incisions, loose bone removed, B.I.P.P. inserted.	5	6	2	46	Healed. Later discharged light duty.
17	90	C.C.Fr. humerus, surgical neck, T. and T., V.S.W.	On day of admission operation, B.I.P.P. inserted.	12	12	7	66	,, ,, ,,
18	7	C.Fr. humerus near elbow-joint, V.S.W.	1 day after admission operation, cleaning, B.I.P.P. inserted.	3	4	1	43	,, ,, ,,
19	97	C.C.Fr. humerus.	3 days after admission operation, cleaning, B.I.P.P. inserted.	6	9	1	49	Healed. Later transferred A.H.
20	106	C.C.Fr. R. humerus mid-shaft. Right hand amputated by shell. C.Fr. L. ulna.	3 days after admission operation, B.I.P.P. inserted.	15	18	5	59	A.H. 97 days all wounds healed. Discharged from Army.
21	177	C.C.Fr. humerus, F.B.	3 days after admission operation, cleaning, many loose pieces of bone removed, B.I.P.P. inserted.	5	8	3	63	Healed. Discharged duty.
22	147	C.C.Fr. elbow. Operation, head of radius removed before admission. V.S.W.	16 days after admission operation, loose bone removed, abscess of joint opened, B.I.P.P. inserted.	4	20	28	98	Healed.
23	16	G.S.W. R. forearm, C.C.Fr. radius, V.S.W. Much loss of tissue. C.Fr. R. humerus, clean wounds.	1 day after admission operation, B.I.P.P. inserted.	8	9	8	65	,,
24	16	C.Fr. radius, V.S.W.	On day of admission B.I.P.P. applied.	8	8	0	55	A.H. Superficial wound, no sinus. Later discharged light duty.
25	51	C.C.Fr. ulna mid-shaft, T. and T.	4 days after admission operation, wounds cleaned. 4 days later B.I.P.P. inserted.	2	10	0	44	Healed. Later discharged duty.
26	92	C.Fr. radius and ulna near elbow.	4 days after admission B.I.P.P. inserted.	14	18	1	66	Healed. Discharged light duty.
27	117	C.Fr. ulna, mid-shaft, V.S.W.	On day of admission operation, B.I.P.P. inserted.	6	6	0	60	A.H. Sinus persistent.
28	142	C.C. Fr. radius, mid-shaft.	7 days after admission operation, B.I.P.P. inserted.	2	9	0	41	Healed. Transferred.
29	169	C.C. Fr. ulna, shrapnel removed, tube inserted before admission.	12 days afebrile, then 7 days rising temperature. 19 days after admission operation, B.I.P.P. inserted.	6	25	9	81	A.H. 81 days. Superficial wound, no sinus. Later discharged full duty.
30	55	C.C.Fr. ulna and radius, T. and T., V.S.W., complicated with empyema.	3 days after admission B.I.P.P. inserted.	37	40	22	56	Wounds of forearm healed. Temperature due to empyema.
31	8	G.S.W. L. hand, C.Fr. metacarpals, V.S.W.	5 days after admission loose bone removed, B.I.P.P. inserted.	3	8	0	33	Healed. Later discharged from Army.
32	74	G.S.W. L. hand, C.Fr. metacarpals, two fingers blown off, V.S.W.	4 days after admission B.I.P.P. inserted.	5	9	9	68	,, ,, ,,
33	109	G.S.W. L. hand, C.C.Fr. 5th metacarpal.	5 days after admission operation, B.I.P.P. inserted.	9	14	3	30	A.H. Later discharged full duty.
34	76	C.Fr. ilium, L.S.W., F.B. near sacro-iliac joint.	8 days after admission operation, B.I.P.P. inserted.	6	14	7	45	A.H. 63 days after wounding discharged full duty.
35	31	G.S.W. buttock, S.B.I. sacrum, F.B.	13 days after admission operation, wounds cleaned, B.I.P.P. inserted.	4	17	19	92	Healed. Later discharged from Army.
36	139	C.Fr. femur, S.B.I., shaft intact.	4 days after admission operation, cleaning, B.I.P.P. inserted.	8	12	7	50	A.H. No sinus.
37	33	C.C.Fr. femur.	3 days after admission operation, cleaning, B.I.P.P. inserted.	6	9	7	38	Healed. Later discharged light duty.

FRACTURED BONES, WHICH HAD LEFT HOSPITAL BEFORE NOV. 30TH, 1916.

No.	Index No.	Nature of injury and condition on admission.	Treatment.	Day of disease admitted.	Day of disease B.I.P.P. treatment began.	No. of days febrile since admission.	No. of days after injury when healed or transferred.	Remarks.
38	34	C.Fr. femur, V.S.W.	4 days after admission operation, B.I.P.P. inserted.	5	9	3	84	Healed. Later discharged light duty.
39	54	C.Fr. femur, upper third.	12 days after admission B.I.P.P. inserted.	7	19	24	70	Healed.
40	137	C.C.Fr. R. femur, near great trochanter, V.S.W.	On day of admission operation, loose bone removed, B.I.P.P. inserted. Later two further operations.	8	8	14	147	A.H. Not healed.
41	17	C.Fr. tibia and fibula, T. and T.	On day of admission B.I.P.P. inserted.	35	35	0	64	Healed. Transferred A.H.
42	29	C.Fr. tibia and fibula, V.S.W.	1 day after admission operation, cleaning, B.I.P.P. inserted.	11	12	8	69	Transferred A.H. Persistent sinus.
43	35	C.C.Fr. tibia and fibula.	1 day after admission B.I.P.P. inserted.	7	8	0	76	Healed. Transferred A.H.
44	67	C.C.Fr. tibia, V.S.W.	3 days after admission operation, cleaning, B.I.P.P. inserted.	5	8	4	38	Superficial wound, no sinus. Later discharged full duty.
45	97	C.Fr. tibia, T. and T.	1 day after admission operation, abscess opened, B.I.P.P. inserted.	27	28	1	97	A.H. Persistent sinus.
46	99	C.C.Fr. R. fibula, T. and T., V.S.W.	14 days after admission B.I.P.P. inserted.	12	26	0	69	A.H. Superficial wound. Later discharged full duty.
47	119	C.C.Fr. tibia, lower third, external malleolus.	3 days after admission operation, B.I.P.P. inserted.	4	7	1	98	A.H. Superficial wound. No sinus. Later discharged from Army.
48	116	G.S.W. leg penetrating tibia, V.S.W.	7 days after admission operation, loose bone removed, B.I.P.P. inserted, wound stitched.	3	10	7	50	A.H. Superficial wound, no sinus.
49	155	G.S.W. L. leg, S.B.I. tibia, S.W.	3 days after admission B.I.P.P. inserted.	10	13	1	23	Healed. Discharged duty.
50	19	G.S.W. L. ankle, os calcis disorganised.	6 days after admission operation, cleaning, B.I.P.P. inserted.	3	9	3	61	Healed. Transferred.
51	20	G.S.W. R. foot, L.S.W., T. and T.	1 day after admission operation, cleaning, B.I.P.P. inserted.	9	10	0	35	A.H. Surface wound, no sinus.
52	28	C.C.Fr. 2nd and 3rd metatarsals, T. and T.	7 days after admission operation, cleaning, loose bone removed, B.I.P.P. inserted.	5	12	1	33	Healed. Later discharged light duty.
53	38	G.S.W. L. foot, T. and T., V.S.W.	1 day after admission operation, cleaning, B.I.P.P. inserted.	3	4	6	77	A.H. No sinus, superficial wound.
54	42	G.S.W. R. foot, T. and T., V.S.W.	1 day after admission operation, cleaning, B.I.P.P. inserted.	3	4	3	40	Healed. Discharged light duty.
55	71	C.Fr. 5th metatarsal, R. foot, V.S.W.	5 days after admission B.I.P.P. inserted.	7	12	0	40	Healed. Later discharged full duty.
56	85	G.S.W. foot, C.Fr. cuboid, T. and T.	5 days after admission B.I.P.P. inserted.	4	9	0	50	" " "
57	80	G.S.W. R. foot, S.B.I. head of 5th metatarsal, V.S.W.	2 days after admission operation, cleaning, B.I.P.P. inserted.	4	6	0	31	" " "
58	91	G.S.W. foot, C.Fr. 1st, 2nd, and 3rd metatarsals.	3 days after admission operation, cleaning, B.I.P.P. inserted.	3	6	6	30	Healed.
59	105	G.W.S. L. foot, C.Fr. 4th metatarsal, V.S.W., T. and T.	1 day after admission B.I.P.P. inserted.	8	9	3	76	Auxiliary hospital.
60	121	G.S.W. foot, S.B.I. head of 1st metatarsal, V.S.W.	2 days after admission operation, B.I.P.P. inserted.	2	4	0	44	Healed. Later discharged full duty.
61	176	G.S.W. L. foot, Fr. 5th metatarsal, T. and T., V.S.W.	1 day after admission B.I.P.P. inserted.	5	6	2	53	Healed. Later transferred.
62	27	G.S.W. foot, C.Fr. 1st phalanx great toe, T. and T., V.S.W.	5 days after admission operation, cleaning, loose pieces of bone removed, B.I.P.P. inserted.	5	10	0	36	Healed. Transferred.

Average febrile period = 6·88 days. Average time since wounding = 61·27 days. Number completely healed = 50.
G.S.W., Gunshot wound. C.Fr., Compound fracture. C.C.Fr., Compound comminuted fracture. S.W., Septic wound. V.S.W., Very septic wound. L.W., Large wound. L.S.W., Large septic wound. T. and T., Through-and-through wound. F.B., Foreign body. S.B.I., Slight bone injury. A.H., Auxiliary hospital.

THE BACTERIOLOGICAL AND CHEMICAL ACTION OF BISMUTH-IODOFORM-PARAFFIN PASTE.

BY HELEN CHAMBERS AND J. N. GOLDSMITH, M.Sc., PH.D.

The clinical results obtained by the use of bismuth-iodoform-paraffin paste recorded in the previous paper have been so striking that an explanation of its action is desirable, particularly as Professor Rutherford Morison, in his paper in THE LANCET of August 12th, 1916, p. 269, states that the explanation of its action is unknown. A series of bacteriological and chemical tests were therefore carried out as far as possible in parallel.

The bacteriological tests have been made in tubes of nutrient broth containing 20 per cent. horse serum, the test organism being a 24-hour culture of *Staphylococcus pyogenes aureus*. The practical details are noted in Table II.

A preliminary test showed that B.I.P.P. completely sterilised after 24 hours' incubation, whereas pastes of bismuth subnitrate or of iodoform with small quantities of paraffin have no appreciable action.

Bismuth subnitrate in water produces a marked acid reaction due to liberation of free nitric acid. In saline or in nutrient broth containing 20 per cent. serum there is a double decomposition with sodium chloride, bismuth subchloride and sodium nitrate being formed; no marked alteration in reaction occurs. The addition of 10 per cent. bismuth subnitrate to the test medium causes partial sterilisation which in time becomes complete; very little effect is obtained with smaller quantities. The admixture of paraffin to the bismuth subnitrate masks its action even when the bismuth salt is present in quantities of 10 per cent.

TABLE II.

Medium: 7 c.c. nutrient broth (reaction + 5); 2 c.c. horse serum; 1 c.c. emulsion of *Staphylococcus pyogenes aureus* in saline. Circa 1×10^9 organisms. Drug added and tubes incubated for 24 hours at 37° C. 1 c.c. diluted 1/1000, plated on agar.

No.	Drug.	No. of colonies.
1.	Iodoform, 2 gm.	250
2.	" 1 gm.	∞
3.	Bismuth subnitrate, 1 gm.	200
4.	" 0·1 gm.	∞
5.	Iodoform, 1 gm. + paraffin, 0·2 c.c.	∞
6.	" 1 gm. + " 0·5 c.c.	∞
7.	" 1 gm. + " 3·0 c.c.	—
8.	Bismuth subnitrate, 1 gm. + paraffin, 3·0 c.c.	∞
9.	Iodoform, 1 gm. + bismuth subnitrate, 0·5 gm.	—
10.	" 1 gm. + " " 0·5 gm. + paraffin, 1 c.c. (i.e., B.I.P.P.)	—
11.	Iodoform, 1 gm. + bismuth subnitrate, 0·1 gm.	4
12.	" 1 gm. + " " 0·01 gm.	50
13.	" 1 gm. + " " 0·001 gm.	20
14.	" 1 gm. + " " 0·00 6 gm.	∞
15.	" 1 gm. + 2 c.c. of N/10 HNO_3 + 5 c.c. broth + 2 c.c. horse serum	4
16.	2 c.c. of N/10 HNO_3 + 5 c.c. broth + 2 c.c. horse serum	700
17.	Iodoform, 1 gm. + bismuth subnitrate 0·5 gm., CO_2 atmosphere after twice washing with medium to remove free iodine. 1, 2, and 3 days' incubation	∞
	After 3 days air admitted and 10 c.c. fresh medium added, 24 hours' incubation	10
18.	B.I.P.P. removed from a wound after 2 weeks	—

— = sterile. ∞ = very numerous colonies.

Chemical experiments on similar lines showed that 1 gm. of bismuth subnitrate, incubated at 37° C. with 10 c.c. of normal saline for 24 hours, produced an acid reaction, N/750, with no bismuth in solution; prolonged incubation

(5 days) removed all the chloride, and produced an acid reaction with bismuth in solution. The bactericidal action of the bismuth subnitrate can therefore be attributed to surface precipitation of the proteid and metallic poisoning, the acid reaction developed in saline in 24 hours being insufficient to produce the result.

Iodoform is practically insoluble in water or saline, but is slightly soluble in paraffin, 2·15 gm. dissolving in 100 c.c. at 37° C. When in solution, and in the presence of oxygen, it is readily decomposed by light or heat, liberating free iodine, the equation, according to Schoorl and Van den Berg,[1] being:

$$10\,CHI_3 + 17\,O = 2\,CO_2 + 8\,CO + 5\,H_2O + 30\,I.$$

The decomposition started by light continues in the dark. Iodoform dissolved in liquid paraffin is not nearly so rapidly decomposed by light as its chloroform, benzene, and carbon bisulphide solutions, and light does not therefore play an important part in the present experiments, particularly as the reaction in the dark is very slow at ordinary temperatures. At 37° C., and in darkness, access of air is the ruling factor.

Two samples of iodoform from the hospital dispensary exhibited great differences in their rate of decomposition. One sample contained in 1 gm. free iodine equivalent to 0·3 c.c. N/100 iodine and decomposed more rapidly than the other, which originally contained no free iodine. The iodine formed by the decomposition of solid iodoform appears to be in solid solution in the iodoform and is only partly available for disinfectant purposes.

As is well known, iodoform in large amounts has a slight bactericidal action, probably due to liberation of iodine; in smaller quantities it has no appreciable effect *in vitro*. When iodoform is suspended in paraffin the disinfectant action depends on the free access of air and, incidentally, on the amount of paraffin added. When used in a thick paste mixed with small quantities of paraffin the drug remains at the bottom of the tubes and the antiseptic action is slight. With larger quantities the paraffin solution of iodoform floats, liberation of iodine occurs, and the medium is sterilised.

In view of the liberation of iodine from B.I.P.P. it became important to find the concentration of iodine in liquid paraffin which would sterilise. 3 c.c. of iodine solution in paraffin of N/100 concentration (1 c.c. = 0·00127 gm.) sterilised 10 c.c. of culture = 1:2600 containing 15 per cent. serum. Dakin, Cohen, Daufresne, and Kenyon,[2] who employed 50 per cent. serum and therefore more proteid in solution, found that iodine sterilised in 1:1000 but not in 1:2500. The volume of air at 37° theoretically sufficient for the liberation of 0·00381 gm. iodine by oxidation of iodoform is 1·03 c.c.

With the object of ascertaining whether the action of the B.I.P. paste is dependent on the base or on the acid of bismuth subnitrate, experiments have been made replacing 1 gm. of bismuth subnitrate with the equivalent weight of one of the following: Bismuth oxide, bismuth subchloride, bismuth carbonate, bismuth subiodide, and sodium nitrate. None of these drugs had any bactericidal action, either alone or mixed with iodoform, with or without paraffin. These bismuth compounds do not yield oxidising agents when treated with normal saline, nor does sodium nitrate readily act as an oxidising agent. Bismuth subiodide which is contained in traces in old specimens of B.I.P.P. stored in glass bottles is also inactive. It follows that the action of the paste is not due to bismuth nor to the presence of a nitrate as distinct from free nitric acid yielded by bismuth subnitrate.

A study of the chemical changes which occur when B.I.P.P. is incubated with normal saline (the details of some of these experiments are given in Table III.) shows that the most important changes are the following:—

1. The oxidation of iodoform, the liberated iodine dissolving in liquid paraffin. The supply of oxygen is the ruling factor. If proteid or other iodine absorbents are present the iodine diffuses out readily from the paraffin layer; the yield of free iodine is less in the absence of these substances. 2 gm. B.I.P.P. yielded 2·4 c.c. N/100 iodine in 48 hours' incubation at 37° with broth and serum.

[1] Chem. Centralblatt, 1905 (2), 1718. (Extensive literature—e.g., Hardy and Willcock, Proc. Royal Soc., 1903, lxxii., 200; Plotnikow, Zeit. f. physical. Chemie, 1911.)

[2] Proc. Royal Soc., 1916, lxxxix., 251.

TABLE III.

In the following experiments (Nos. 1-8) 2 gm. of B.I.P.P. were heated to 37° C. under the conditions stated.

No.	c.c. air available.	c.c. saline.	Time in hours.	Iodine in saline.‡	Free iodine in residue.‡	NaCl original grammes.	NaCl final grammes.	Reaction.	Bismuth in solution.
1	12	0	71	—	1·3	—	—	—	—
2	0	12	20	—	0·0	0·093	0·073	Neutral	0
3	20	10	24	0·15	0·05	0·078	0·028	,,	0
4	20	10	48	0·3	0·1	—	—	,,	—
4	20	10R	48	0·4	0·1	—	—	—	—
5	20	10	68	1·0	0·2	—	—	—	—
6	20	25	68	1·0	—	—	—	—	—
7*	40	10	20	0·3	0·1	—	—	—	—
8*	40	10	17	0·66	0·1	—	—	Neutral	0
9†	40	10	144	0	4·9	—	—	—	—
10†	40	10	144	0	3·75	—	—	—	—

‡ As c.c. N/100 iodine. R = renewed.

* In No. 7 the B.I.P.P. used had been previously heated at 37° C. for 24 hours in an open tube; in No. 8 the B.I.P.P. had been previously heated at 100° for 6 minutes. Free iodine was estimated before and after incubation, but the table shows only the iodine liberated during incubation.

† In No. 9 the B.I.P.P. was replaced by 1 gm. $BiONO_3$ + 2 gm. CHI_3 + 3 c.c. paraffin, in No. 10 by 2 gm. CHI_3 + 3 c.c. paraffin; in both experiments the saline was replaced by distilled water and the temperature was 47° C.

2. An exchange of acid radicles between the sodium chloride and the bismuth subnitrate, so that the latter may be converted as to 60 or 70 per cent. into bismuth subchloride. This change occurs both *in vitro* and also in B.I.P.P. in a wound, as shown by the following analysis:—

	% Bi_2O_3	% HNO_3	% Cl.
Original $BiONO_3$	80·91	7·7	—
$BiONO_3$ recovered from B.I.P.P., in a wound 3 weeks	72·1	2·69	8·4

3. The formation of traces of iodide in the saline solution.

The following negative results are also of interest:—

1. The absence of bismuth salts in the solution except in exceedingly minute quantities; on one or two occasions this amounted to 0·0002 gm., as $BiONO_3$ in 10 c.c., but in the majority of experiments with normal saline it could not be detected.

2. The absence of more than traces of bismuth subiodide in the B.I.P.P. after incubation.

If B.I.P.P. is heated on a water bath until it is distinctly coloured by free iodine the subsequent rate of decomposition at 37° is considerably increased.

It seems clear, therefore, that the bactericidal action of B.I.P.P. results from the free iodine liberated from the oxidation of iodoform by oxygen and by the nitric acid formed by the hydrolysis of bismuth subnitrate. One gramme of this drug incubated at 37° C. for 24 hours with 10 c.c. of water produced N/50 nitric acid (0·1 per cent. HNO_3). In experiments made with iodoform and N/50 or N/100 nitric acid added as oxidising agents, in the absence of bismuth subnitrate, sterilisation was obtained, and the corresponding chemical tests suggested that when the oxidisation has begun nitrous acid (of which a trace was detected) can act catalytically with atmospheric oxygen as it does on potassium iodide.

On this hypothesis it should be possible to reduce very largely the quantity of bismuth subnitrate and still obtain bactericidal action, provided oxygen is available, but in the absence of oxygen the reaction should cease, even with the usual maximum amount of bismuth subnitrate. Both these conclusions were confirmed by *in vitro* experiments. The chemical analyses gave the following results:—

Oxidation of iodoform in presence of bismuth subnitrate and saline.—2 gm. of iodoform, 10 c.c. of normal saline, and varying quantities of bismuth subnitrate were heated for 5 days at 37°.

—	Bismuth subnitrate.	Acid reaction.	Free iodine in residue.	Total iodine in solution.
1	0·1	N/10,000	2·3 c.c. N/100	0·2 N/100
2	0·5	N/2,000	2·2 ,, ,,	0·2 ,,
3	1·0	N/30	6·1 ,, ,,	0·1 ,,

In the third experiment the sodium chloride originally present was 0·078 gm. which was found to be partly converted

into sodium nitrate, the final quantity of sodium chloride in solution being only 0·049 gm.

In the bacteriological tests the bismuth subnitrate has been reduced from 1 gm. to 0·001 gm., with no marked diminution in the antiseptic action. Further, when oxygen is eliminated by replacing the air with an atmosphere of CO_2 (any free iodine originally present in the mixture having been removed by washing with fresh medium), the paste has no appreciable antiseptic action. Air subsequently admitted enables it to disinfect as usual.

The mechanical effect of fluids percolating through a film of B.I.P.P. tends to remove the paraffin—there is then a possibility of bismu h disinfection; some of the bismuth subnitrate, which is lighter than iodoform, is also removed. The chief reaction is the continued liberation of small quantities of iodine from a mixture practically insoluble in saline, governed by the oxygen supplied from the air or from arterial blood.

Numerous cultures taken from open wounds under B.I.P.P. treatment have shown, without exception, that the wounds are not bacteriologically sterile, but there is a reduction in the number of bacteria. No change in the flora has been detected. A large number of the wounds are infected with anaerobic organisms, and *B. perfringens*, *B. malignant œdema*, *B. Hibler IX.*, and *B. tetani* have been recovered from some of these cases. Although the organisms are present in the wounds they are not able to proliferate freely, and the wounds heal as if surgically clean.

Most of the cases under this treatment excrete to a varying extent products of the decomposition of iodoform, and the general effects of iodide absorption may have some bearing on the results.

CLINICO-ANATOMICAL INVESTIGATION OF A RAPIDLY FATAL CASE OF GENERAL PARALYSIS DUE TO ACQUIRED SYPHILIS.

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AND
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THE following case has several striking and unusual features which we think should be recorded. It is that of a young married woman, 26 years of age, who came under care at Bexley Asylum on June 19th, 1916, suffering from general paralysis. Her previous history is as follows:—

She was the tenth child of a family of 11, seven of whom survive her, all said to be healthy and strong. The father died at the age of 59, following an accident sustained two years previously. The mother is alive and well and was the source of our information. The patient was a tall girl for her age, well developed, and had no indications of any congenital disease. She had commenced work as a daily girl at 15 years of age, and was afterwards engaged at a mineral-water manufactory until her marriage at the age of 19. She was "considered a bright, intelligent girl," was "always fond of her home," "never gave her parents any trouble," and was "never given to racing out at night." She kept company with the young man she ultimately married from the age of 17, was married at 19, and gave birth to her first child a week later. The infant was "a fine, big, healthy child," and was suckled by the mother until it was ten months old. The boy is now living, and is a well-developed intelligent boy just seven years of age. His blood was examined by Dr. Mott and was found to give a negative Wassermann.

Two years after her marriage the patient gave birth to a four months fœtus. She had a very bad time and took several weeks to recover. Fifteen months later she gave birth to a dead child which was thought to be seven and a half months. During this pregnancy she complained bitterly about pains in her head; she had bad sore-throats very frequently, and her voice became much altered in tone. She became pregnant a fourth time, and expected her confinement at the end of March, 1916. Her mother stated that the patient was out shopping on Saturday evening (March 4th) with her little son. She called at her house, and when she sat down commenced trying to speak, but her words all ran into each other and her voice became very tremulous, so that what she said was unintelligible. She took her home and the patient partially recovered her speech in about half an hour, though it still remained very tremulous and indistinct. She was not seen by a doctor. She became markedly worse the following Thursday; she had three fits, and was taken to the infirmary. Information obtained from the infirmary was to the effect that she was in a semi-conscious condition; vomiting continuously; incontinent; did not speak unless addressed, and then only with difficulty; and did not sleep well. She was confined of a female child, weighing 5½ lb. and measuring 19½ inches, four days after her admission. No albumin was found in the urine. On March 17th she became melancholic; was still incontinent, but was taking food. She remained in more or less the same condition until June, when she became noisy and inclined to wander. There was nothing remarkable in connexion with the labour, and the child died of infantile atrophy.

For this information we are obliged to the medical officer of the infirmary, and he also stated that there was no good evidence of congenital syphilis.

She was certified insane on June 16th, the medical certificate being as follows:—

That she is restless; does not seem to know people; says she loves me; appears to have hallucinations of sight and hearing; talks to imaginary people; does not appear to have any memory; is dirty in habits. Nurse states that she is noisy and troublesome; that she talks to imaginary people; says her baby is in the next bed to hers, and swears at it; says another patient has stolen her baby; is spiteful to those who came near her; does nothing for herself.

She was admitted to Bexley on June 19th, her physical and mental state then being as follows:—

General bodily condition and nourishment fair. No stigmata of congenital disease. Complexion fresh. Palate: wide arch. Teeth well formed and regular. An abundance of brown, fine hair. Nervous system: motor impairment considerable, partly in consequence of incoördination. Coarse general tremors. Speech tremulous. Coördination of arms impaired; of legs very bad. Station and gait impossible. Tactile sensation could not be tested. Knee-jerks absent. Ankle clonus spurious. Deep reflexes of arms brisk. Brisk flexor plantar reflex. Other superficial reflexes indefinite owing to muscular contractions. Deglutition normal. Sight good. Movement of eyes complete. Pupils: size medium, equal, regular. Mobility to light: right nil; left very slight; to accommodation (r. and l.) fair; consensual (r. and l.) nil. Exophthalmos: nil. Other systems: nothing remarkable.

Mental state on admission. She was confused, quite unable to realise the nature of her surroundings, and could not give any reliable information about herself. All the mental faculties were grossly impaired. Though she chattered a great deal of nonsense about herself, there was no evidence of definite hallucinations or delusions. Most of the time she was unduly elated, hilarious, and self-satisfied, but she readily became lacrymose. She was restless, garrulous, picked at her bedding, and had a trick of stuffing the corner of the sheet into her mouth. She showed a good deal of purposeless resistiveness and muscular rigidity. Was defective in habits and required spoon-feeding.

Her condition was diagnosed as one of general paralysis of the insane; but as we had no definite history with her it became a question, in view of her age and the vague statement accompanying her that she had a family, as to whether she was a case of congenital or acquired syphilis. Her blood and cerebro-spinal fluid were examined at the Pathological Laboratory of the L.C.C. Asylums, Maudsley Hospital, and found to give a very strongly positive Wassermann reaction. On June 26th her condition was noted as follows:—

She is suffering from general paralysis of the insane. She is very demented, happy, contented, and emotional. Her memory is grossly impaired, and she is unable to converse on the simplest topic. In happy, slow, slurred, and hesitating speech, she said: "I love gentlemen." She is fairly nourished.

The disease made very unusually rapid progress, and she died from exhaustion of general paralysis on Sept. 25th. Only a partial autopsy was possible, but we managed to

obtain the brain. Macroscopic examination did not reveal any of the naked-eye appearances of brain syphilis or of G.P.I. The granulation of the floor of the fourth ventricle is the most characteristic and constant naked-eye sign, and it was absent in this case; moreover, the membranes were not thickened. Nevertheless, an emulsion of a small portion of the frontal lobe examined by Dr. Mott microscopically by dark-ground illumination and by Fontana staining method demonstrated the presence of numbers of spirochætes.

We had several interviews with the husband, who stated that he remembered his wife complaining of her hair coming out and of being troubled with sore-throats and headaches, more especially during the period which followed her third pregnancy. We obtained a sample of his blood for examination, as well as that of the boy, the results of which have been mentioned. The husband denied having suffered from any form of disease, and certainly bore no obvious traces. He was emphatic in his protestations against ever having suffered from a sore either of the genitals or elsewhere. Dr. Mott found that his blood gave a positive (+ 40) Wassermann reaction.

The points which occur to us as being worthy of especial notice are:—

1. The extreme rapidity which characterised the progress of the disease, six months and a few days only elapsing between the earliest observed symptoms and death.

2. The naked-eye signs of the disease were not apparent, and, but for the presence of the Wassermann reaction of the cerebro-spinal fluid (during life and post mortem) and the finding of the spirochætes in the brain, it would have been difficult to have come to a decision as to the cause of the mental symptoms manifested during life.

3. The case is of interest in showing the value of the examination of the cerebro-spinal fluid as a means of diagnosis in even the earliest stages of the disease; it is also of interest in the fact that the spirochætes were found in an emulsion of the apparently normal brain by the dark-ground illumination method, after five minutes' search. This conforms with the experience of Levaditi, who showed that spirochætes could be found at the seat of inoculation before the chancre appeared. There was no time for the connective-tissue formation to occur in a sufficient degree to cause naked-eye changes of the brain, but histological investigation of sections of the frontal and central cortex, however, showed the characteristic chronic perivascular inflammation; and by the special silver method spirochætes were found in sections of the inflamed areas. It may be inferred, therefore, that the multiplication of the syphilitic organisms in the brain was the cause of the deviation of the complement by the cerebro-spinal fluid, and that the abundant toxins produced by the rapid growth of the organism were responsible for the perivascular inflammation and neurone degeneration.

4. These histological microscopic changes may be correlated with the characteristic clinical symptoms presented by the case for the comparatively short time prior to the fatal issue. It has been the experience of Dr. Mott to find that the spirochætes are more easily found in these rapidly fatal acute cases, in which macroscopic changes are not evident, or not markedly so. A likely spot for finding the spirochætes may be disclosed by feeling gently the cortex, and if the resistance is less marked an emulsion of that region is advisable, but emulsions of cortex from several soft spots should be made. It may be mentioned here that in 100 successive cases of general paralysis spirochætes were found in 66. In advanced cases where there has been arrest of active symptoms, and death has occurred from some intercurrent disease in the demential stage, the syphilitic organisms are less easily found.

5. Contrary to the original statement of Noguchi, the spirochætes are found in the inflammatory cell infiltration of lymphocytes and plasma cells of the perivascular sheaths, rather than in the cortical brain substance; and this has been my experience in other cases. This being the case, we can understand why the cerebro-spinal fluid gives a positive reaction in the earliest stages of the disease, for the perivascular sheaths form a part of the irrigation system of the cerebro-spinal fluid, which functions in all probability as the lymph of the brain. It is the toxins produced by the spirochætes, and not the organisms themselves, which produce the chronic inflammatory process, for only at certain places can the spirochætes or their degenerated forms be seen. Consequently the spirochætes at a focus of development, by virtue of the soluble toxins produced, may have a far-reaching irritative effect on the perivascular lymphatic sheaths, leading to widespread congestive stasis and neurone decay. Prior to the decay the toxins contained in the perineuronal spaces may irritate and lead to increased functional activity of the neurones, and the excitement evinced in the early stages of this disease may be thus accounted for by intoxication effects acting more or less on the whole brain, but, as in the case of generalised epileptiform seizures, on the motor cortex especially.

Although there was no naked-eye cortical atrophy, indicative of neuronic decay and destruction and neuroglia-cell proliferation, yet the histological examination showed that both these morbid processes were present over a wide area of the fronto-central cortex.

THE PREVALENCE OF *SPIROCHÆTA EURYGYRATA* IN EUROPEANS AND NATIVES IN THE GOLD COAST.

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RECENTLY, owing to the return to England of a large number of soldiers suffering from dysentery and diarrhœa, a general interest has been evoked in a number of protozoal organisms which for many years have been familiar to every worker in the tropics. Amongst others the spirochætes found in the intestines have come in for their share of attention, and the commonest species, *Spirochæta eurygyrata*, has recently been described in detail by Fantham (1916).

In West Africa the occurrence of small spirochætes in the fæces has long been recognised, but the consensus of opinion has been that they were not pathogenic. Under abnormal conditions, in cases of dysentery or diarrhœa, however, they were known sometimes to occur in myriads, and it was believed they might in these circumstances be a subsidiary cause of illness. In view of the revived interest in these organisms a brief note on their prevalence in Europeans and natives in the Gold Coast Colony may not be inappropriate.

Materials Examined.

Previous experience had proved that the spirochætes were most readily found in the fæces after purgation, and for this reason most of the specimens examined were taken from patients to whom a saline aperient had been administered for simple constipation, as a preliminary to surgical treatment, or for the purpose of ascertaining if helminth infections were present; but in addition the fluid or semi-solid motions from cases of dysentery and diarrhœa were searched as well as some normal stools. The specimens were examined both fresh and after fixation and staining. Leishman's stain and gentian violet were used; the latter when drawings were to be made for the purpose of measuring the length of the organisms, and the former when the structure of the cytoplasm was to be studied.

Flagellates, *Trichomonas*, &c., are also very commonly met with in fæces in the Gold Coast and had to be remembered, as their flagella, which they are apt to lose, sometimes simulate spirochætes. This fallacy, although it had to be kept in mind, was not found to be a serious difficulty in practice. The (?) sprouting vegetable cells, so troublesome in many animals, are, fortunately, absent from men.

In this manner a large number of Europeans and natives and a few Syrians have been examined since February, 1916, and in every case spirochætes have been present. I have not failed so far to discover them in a single individual examined for these organisms at Accra. In the Europeans they were generally relatively scarce, but in many of the natives and some Europeans they were abundant. Cases of amœbic dysentery were not, as a rule, exceptionally heavily infected, but in some patients suffering from diarrhœa they were so numerous that it was difficult to believe that they could have been entirely harmless.

The last 20 cases examined, which included 5 Europeans, 14 natives, and 1 Syrian, may be taken as a typical sample. In the Europeans the spirochætes were scanty in 4 and abundant in 1, the latter individual being a healthy man.

One subject was simultaneously infected with *Entamœba histolytica* and another with *Trichomonas intestinalis*. Both loosely and closely coiled organisms were found in 2 cases, and in the other 3 loosely coiled specimens only. In the natives the spirochætes were abundant in 8 and scanty in 6 persons; in 4 they were countless. Three of the subjects were simultaneously infected with *E. histolytica*, 3 with *Trichomonas intestinalis*, and at least 2 with *Blastocystis enterocola*. Of the 4 most heavily infected individuals 2 showed spirochætes only; 1 harboured *Trichomonas* and *Blastocystis*, and 1 *E. histolytica* and *Blastocystis* as well. Only loosely coiled spirochætes were found in 10 cases, only closely coiled ones in 1, and in the remaining 3 both types were present. The single Syrian examined harboured a few loosely coiled spirochætes; his fæces also contained ova of *Tænia saginata*.

Morphology.

Werner (1909) described two types of spirochætes found in his own fæces at a time when he was apparently in good health, but as he had previously been in German South-West Africa his infection may have been contracted in that country. The one type, to which he gave the name *S. eurygyrata*, showed widely separated coils and varied in length from 4·6 μ to 7·3 μ; the other, *S. stenogyrata*, had a closely coiled body from 3·5 μ to 6·1 μ long.

Fantham (1916), as a result of his study of the spirochætes, found in the motions of soldiers from Gallipoli and Flanders, has concluded that the two species described by Werner are really morphological variations of the same organism, which he finds may show widely or closely set waves according to the nature of its movements, and may measure from 3 μ to 15 μ in length. The spirochæte has pointed ends and is about 0·25 μ broad.

The spirochætes found on the Gold Coast conformed fairly well to the description given by Fantham. In the majority of the specimens the organisms showed only a few widely set waves, but in a few they were all closely coiled, and in others both forms were met with. Both types of the spirochæte had pointed ends, and when measured were found to be of about the same length and breadth. It was decided, therefore, that although superficially unlike each other they must really be forms of the same parasite, a conclusion which was confirmed by measuring a large number of the organisms from different cases and plotting their lengths as a curve. The organism was therefore identified as *S. eurygyrata* Werner, emend. Fantham.

Since a detailed description of this spirochæte has recently been published it will be unnecessary to do more than briefly state the more important characteristics. When alive the organisms were very active, exhibiting lashing, undulatory, and corkscrew movements. The most active individuals were those executing lashing movements and in them the coiling of the body was more or less obscured. Progression was accompanied by rapid helicoid movements, the axis of the spirochæte being often a straight line. Either end might advance, and a reversal of direction was frequent. Catherine-wheel-like movements were seen and in stained preparations tangles were found. The body was

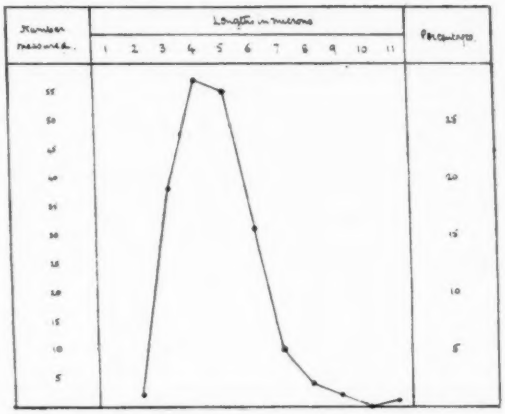
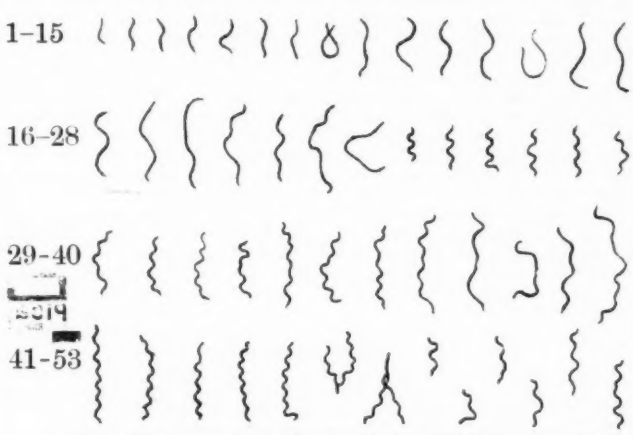


Chart showing measurements of length plotted as a curve.

flexible and was bent into a variable number of waves or coils. Some spirochætes were simply curved like a bow, many had two or three waves, and some had as many as six or more. The number of the waves varied with the thickness of the organism and also with the character of its movements. I cannot, however, completely confirm Fantham's statement that the number of coils is primarily an index of rate of motion, for on the one hand the most active spirochætes were those showing lashing movements, and they were only loosely coiled, and on the other hand quiescent or dead specimens were often closely coiled. The most closely coiled organisms I ever saw were some that had died in a preparation with hydrochloric acid (0 2 per cent.) which had been incubated at 37° C. for six hours (Figs. 41-45). The spirochætes in the saline solution control to this experiment were still alive and active and were decidedly more loosely coiled (Figs. 48-53). The ends of the organisms were pointed. The cytoplasm was generally homogeneous, but occasionally the body was seen to be banded by chromatin rodlets. So small and delicate were the spirochætes that the membrane, if it existed, was in most specimens indistinguishable; in a few, however, there did appear to be some indication of its presence. Coccoid bodies were seen within a few specimens.



All the figures were drawn with the aid of an Abbé-Zeiss camera lucida at a magnification of 2000 diameters. Figs. 1–40, various forms of *S. eurygyrata* found in human fæces; Figs. 1-22, loosely coiled type; Figs. 23–35, closely coiled type; Figs. 36–40, forms undergoing transverse fission. Figs. 41–47, closely coiled forms found after exposure to 0·2 per cent. hydrochloric acid; Figs. 46 and 47, showing longitudinal division. Figs. 48–53, spirochætes from the control in normal saline solution for comparison with Figs. 41–45.

The spirochætes were very slender, measuring about 0·25 μ in breadth. It was impossible to determine their diameter with accuracy, but some specimens were sensibly thicker than others.

The length of the spirochæte was determined by measuring 200 individuals taken as they came from 10 different cases (see Table I.). The shortest measured 2 μ, the longest 11 μ, and the average was 4 7 μ. This statement is, however, misleading, as the longer forms were rare, and the same remark applies, I believe, to that made by Fantham to the effect that *S. eurygyrata* varied in length from 3 μ to 15 μ. A much better idea of the length of the spirochæte is obtained by plotting the measurements as a curve, as has been done in the chart shown above. It is then seen that 75 per cent. of them measured from 3 μ to 5 μ, and no less than 90 per cent. were within 4 microns of each other in length, between 3 μ and 6 μ. Very occasionally extremely long individuals were found, some of which exceeded 30 μ in length. These forms I believe to have been multiple.

The spirochæte underwent both longitudinal and transverse division. Dividing forms composed of two daughter spirochætes united by a delicate filament were relatively rarely seen, but those that were found measured from 7 μ to 11 μ in total length and the daughter spirochætes from

3 μ to 5 μ. The number of dividing forms included in the 200 specimens measured was not sufficient to produce a secondary crest on the curve.

Spirochætes resulting from a recent division might therefore measure from 3 μ to 5 μ in length, and individuals which had reached 7 μ might already be undergoing transverse division, although most commonly this would not happen until they were somewhat longer. The natural size of the organism would appear to be approximately 3 μ to about 8 μ.

TABLE I.—*The Measurements of Length of* S. eurygyrata *Werner, emend. Fantham.*

Host.	Number measured.	Measurements in microns.		
		Minimum.	Maximum.	Average.
European ...	10	2	6	3·6
,, ...	10	3	7	4·1
,, ...	10	3	11	5·9
,, ...	25	3	7	4·6
Native	10	3	6	4·2
,, ...	10	3	6	4·5
,, ...	25	3	6	4·2
,, ...	25	3	7	4·4
,, ...	25	2	9	5·3
,, ...	50	3	9	4·9
—	200	2	11	4·69

For some time after death the spirochætes continue to be recognisable, although they do not long survive their host. In smears of the intestinal contents made at autopsies about 24 hours after death they are all dead, but still preserve their normal coiled appearance. When stained their bodies are affected somewhat irregularly and give the impression that they are partially degenerated. On one occasion 25 individuals, taken as they came, were measured and were found to average 5·7 μ in length, a figure slightly greater than that for fresh specimens.

Geographical Distribution.

So far as I am aware there are no data from which the geographical distribution and frequency of occurrence of *S. eurygyrata* can be determined. There are, indeed, a few references in the literature to the occurrence of spirochætes or spirilla in human fæces, and some of these have been collected by Fantham, but they are of little assistance. It does not appear to be definitely known whether or not they occur in normal or diarrhœic motions in Europe.

Fantham states that "perhaps even as high as 50 per cent. of the cases examined" by him were infected with these organisms, but most of his patients were soldiers suffering from various forms of dysentery or diarrhœa contracted in Gallipoli or Flanders; many of them must previously have resided or served in tropical countries, and they had probably all been exposed to the chance of infection by contact with other soldiers who had served in the tropics. A few normal persons were also examined, but it is not stated that spirochætes were found in any of them.

In view of the fact that *S. eurygyrata* appears to be invariably present in the human intestine at Accra on the Gold Coast, West Africa, it would be interesting to know if the infection is equally common in other tropical countries and if it also occurs in healthy persons in Europe.

Distribution of the Spirochætes in the Host.

The fact that the spirochætes were most easily found after purgation or in persons suffering from diarrhœa suggested that they frequented mainly the upper reaches of the bowel and were swept thence into the large intestine and rectum. A series of preparations made at an autopsy showed that the organisms were present in the stomach, in the small intestine at various points, in the cæcum, and in the large intestine, but in this particular case they were not plentiful in any of these situations. In a second case they appeared to be most numerous in the cæcum, but were nowhere abundant.

The action of the gastric juice might have been expected to be injurious to such a delicate organism as *S. eurygyrata*, and as evidence obtained from the examination of specimens taken after death is not indisputable some experiments were carried out in the laboratory to determine the action of 0·2 per cent. hydrochloric acid. A small portion of fæces in which spirochætes abounded was emulsified with the acid solution and kept in an incubator at 37° C., and simultaneously a control with normal saline solution was made. The acid had no immediate injurious action on the spirochætes, but on some occasions appeared to stimulate their activity, and for an hour or two, at any rate, living specimens continued to be present and no sensible difference could be detected between them and those in the controls. It was not easy to be certain that none of the spirochætes were killed, however, owing to the minute size of the organisms and to the fact that in every sample both immobile and active individuals were present. In one such experiment living spirochætes were still present in the acid solution after two hours' incubation, and appeared to be just about as numerous as in the controls; but after six hours they had all died, whereas those in the controls were still most lively. By this time evaporation had considerably reduced the volumes of the fluid, a fact which may have been important. Smears were made from these preparations at this stage, and after fixation were stained. In the controls the spirochætes, which had been extremely active, were found to be loosely or but moderately closely coiled (Figs. 48–53); but in the acid solution they were all unusually closely coiled (Figs. 41–45). Certain other changes appeared to have taken place: many of the spirochætes were exceptionally thick and Y-forms (Figs. 46 and 47) were common, as if longitudinal division had been active before the organisms died; a number of multiple forms were found, and coccoid bodies were quite common. These changes seemed to indicate that as the solution concentrated the spirochætes endeavoured to meet the situation by emergency measures.

Mode of Infection.

In the case of an organism so widely distributed as we have found *S. eurygyrata* to be there can be no difficulty in the spread of the infection, either directly or by the contamination of food. When exposed to the action of 0·2 per cent. hydrochloric acid in laboratory experiments the spirochætes did not appear to be injuriously affected, for some hours at any rate; indeed, their activity often seemed to be increased, and at autopsies smears made of the stomach contents showed that they were present in this part of the gastro-intestinal tract. Infection from man to man by means of the spirochætes themselves is therefore a possible and probable event.

The occurrence of spirochætes in which the cytoplasm had concentrated so as to form granules pointed to another means of dissemination, for these so-called coccoid bodies have been considered to be the cross-infective stage. Fantham (1914 and 1915) believes that *S. bronchialis* is transmitted from man to man by means of these bodies, and although he cannot be said to have proved the fact he has brought forward some evidence in support of it. The same author speaks of them as being "resistant." It, indeed, the granule phase is an integral part of the life-cycle of spirochætes, as seems most probable, it is a reasonable hypothesis to suppose that they play a part in the dissemination of the organisms. In the lower bowel during the solidification of the fæces, and more particularly when exposed to the air after expulsion, the spirochætes find themselves in a medium in which their normal active life cannot be continued, and perhaps in consequence proceed to the formation of coccoid bodies. Unfortunately, it is at present impossible to recognise these bodies when freed amongst the innumerable granules found in the fæces, but they are often seen before they escape from the parent spirochætes, and if they are resistant they must be an important factor in transmission, since they might convey infection from man to man through the air, on soiled linen and utensils, and by the agency of flies, &c.

The Occurrence of Spirochætes Resembling S. eurygyrata *in Various Animals.*

Elsewhere I have recorded (1915) the occurrence of a spirochæte resembling *Spirochæta eurygyrata* in the intestine of a monkey which died of amœbic dysentery in Accra. These organisms averaged a little over 5 μ in length and were indistinguishable from the species found in human beings.

More recently I have examined the fæces of a few other animals—namely, sheep, cattle, goats, pigs dogs, cats, and rats—and have found in them spirochætes similar to, if not identical with, *S. eurygyrata*. They did not appear to be pathogenic to their hosts, and I am inclined to regard them as saprophytes. This is not the proper place to describe these organisms in detail, but I may perhaps be permitted to

make a few remarks about them in view of their bearing on the human infection.

Spirochætes not readily distinguishable from *S. eurygyrata* were found in sheep. Some of them had loosely, others closely, coiled bodies; their ends were pointed, they were very slender, and of 25 drawn with the aid of a camera lucida the shortest measured 3μ, the longest 7μ, and the average was 4·7μ. Very similar, if not identical, organisms were found in cattle, pigs, and goats; but in these animals, when stained preparations were examined, great difficulty was experienced in distinguishing the spirochætes from other bodies, probably of a vegetable nature.

In rats, both the wild and the albino *Epimys rattus*, intestinal spirochætes were exceedingly common and were morphologically indistinguishable from *S. eurygyrata*. There is therefore no necessity to repeat the description, but in Table II. a few measurements of length are given in support of my statement.

TABLE II.—*The Measurements in Length of Intestinal Spirochætes from Man and Various Animals.*

Host.	Number measured	Lengths in microns.										
		1	2	3	4	5	6	7	8	9	10	11	Average.
Man ...	200	—	2	38	57	55	31	10	4	2	—	1	4·7
Monkey	25	—	—	—	5	10	8	2	—	—	—	—	5·3
Rat	50	—	3	8	8	11	12	4	3	—	1	—	5·0
Sheep ...	25	—	—	3	7	11	3	1	—	—	—	—	4·7
Cattle ...	25	—	—	8	7	2	3	2	3	—	—	—	4·7
Goat ...	25	—	—	3	3	8	5	4	1	—	1	—	5·5
Pig	25	—	—	3	6	6	6	2	—	2	—	—	5·2
Dog ...	50	—	10	23	13	4	—	—	—	—	—	—	3·2
Cat	25	1	11	9	4	—	—	—	—	—	—	—	2·4

The spirochætes found in the fæces of cats and dogs appeared to be similar, but they were much more abundant in the latter animals. They were of a type resembling *S. eurygyrata*, but appeared to be smaller. When alive the structure and movements of the organism did not show any characters of specific importance. The spirochætes were generally loosely but sometimes rather closely coiled; their ends were usually pointed, but in the smallest specimens were more blunt; tangles were seen and specimens showing chromatinic rodlets and coccoid bodies; and individuals undergoing both longitudinal and transverse division were observed. The spirochætes were slender but varied in thickness. They were usually very small. Fifty individuals from a dog taken as they came and drawn with the aid of a camera lucida averaged 3·2 μ in length, the shortest being 2 μ and the longest 5 μ. Elsewhere in the same film longer specimens reaching 9 μ were, however, found.

These spirochætes may have been morphological variations of *S. eurygyrata*, but I am inclined to think that they were more probably a distinct but closely allied species. It will be necessary to study their morphology more thoroughly than has as yet been possible before deciding this point.

It is, of course, well known that spirochætes are common in the alimentary canals of animals. All that the above remarks are intended to indicate is that various domestic animals, including rats, harbour in their intestines and excrete in their fæces spirochætes that cannot be distinguished by morphological characters from *S. eurygyrata*, the organism which infects man. Whether the various spirochætes are actually identical or not it is difficult to say; and as they are not definitely pathogenic and as infection is so common both in men and animals at Accra experiments can be of no assistance in this case. This type of spirochæte is evidently widely distributed, and if, as I believe, it is saprophytic there does not appear to be any decided reason why some of the forms found in animals should not be capable of thriving also in the human intestine, in which case they must be an important source of infection to man.

Pathogenicity.

As has already been stated, *S. eurygyrata*, in larger or smaller numbers, has been found at Accra in the fæces of every individual, whether European or native, examined for these organisms. As the majority of the persons examined were in a normal state of health, the pathogenicity of this spirochæte must be very slight, if indeed it is at all harmful. Hitherto in West Africa it has been regarded as unimportant but capable of multiplying in a debilitated host or in a diseased intestine to such an extent that it might become a contributory cause of sickness. In some cases of diarrhœa for which no definite cause could be found spirochætes have been present in countless numbers. It is hardly possible that under such circumstances they can be entirely benign.

Fantham states that he has seen the spirochætes penetrate epithelial scales in the fæces, become quiescent, and produce in them their "resting coccoid bodies." I have not myself seen this occur, but unless the event witnessed by Fantham was an abnormal one it is possible that the spirochætes penetrate also the cells lining the intestine, in which case their pathogenicity would be indisputable. The organism may perhaps pass through an intracellular phase similar to that which I have recently described as occurring in a urethral spirochæte, but I was not able to discover any evidence of this. The possibility must also be considered of the spirochæte under certain circumstances invading the blood and producing a generalised infection; and in this connexion it may be recalled that *S. icterohæmorrhagiæ*, the parasite discovered by Inada (1914) in Weil's disease, is described by Ito and Matsuzaki (1915) as measuring in length from a quarter the diameter of an erythrocyte to five times this length, and is in other respects morphologically a very similar organism to *S. eurygyrata*. The infection in Weil's disease has, indeed, been thought to occur through the alimentary canal (Weil, Fiedler), although the Japanese investigators appear to have favoured a cutaneous route. So far as could be ascertained, the parasites appeared to be merely saprophytic in the cases I have examined, but in the present state of our knowledge the question cannot be considered as settled.

There is one aspect of the effect of a tropical climate that has not hitherto received the consideration which is, I believe, its due, and that is the alteration produced in the intestinal flora and fauna. In their native lands Europeans are habituated to the presence of certain organisms in their intestines &c.; they live, so to speak, in symbiosis with them, and their physiological processes are suitably adapted. In a tropical country they are called upon to readapt themselves to a new set of organisms, and it is possible that much of the ailing and unfitness and many of the obscure effects of "climate" that cannot definitely be traced to meteorological conditions or recognised infections may be due to a failure to cope successfully with this demand. West Africa, for example, is by general consent admitted to have a most unhealthy "climate," and yet the meteorological conditions in many parts of it are not exceptionally bad, and many of the most devastating diseases of other tropical countries are either entirely unknown or but rarely encountered in it. There are, of course other meteorological conditions besides temperature and humidity, other pathological conditions besides those at present recognised, and various social, domestic, and organic factors that have to be considered; and amongst these unidentified influences the alteration in the intestinal flora may, I suggest, have its place. *Spirochæta eurygyrata*, which has been found to be practically always present in the human intestine at Accra, may therefore have some importance if on investigation it is found that this is an exceptional state of affairs.

Conclusions.

1. *Spirochæta eurygyrata* Werner, emend. Fantham, is well-nigh an invariable inhabitant of the human intestine at Accra on the Gold Coast, West Africa.

2 Similar, if not identical, organisms are found also in the intestines of various animals.

3 As a rule, the spirochætes appear to be non-pathogenic—that is to say, their presence is not incompatible with a normal state of health, but under certain conditions they multiply so enormously that it is difficult to believe that they can be entirely benign.

Note.—Since the above was written the study of the intestinal spirochætes of animals at Accra has been continued and an account of the results has been published in the *Annals of Tropical Medicine and Parasitology*, vol. x., pp. 331–343. It may therefore be of interest to add to what has already been stated that a monkey, a cat, rats, sheep, cattle, goats, and pigs were found to harbour organisms morphologically indistinguishable from *S. eurygyrata* the species found in man. Another advance in the knowledge of the subject is due to Mr. H. F. Carter (Ibid., x., p. 391), who has recently published some remarks on the occurrence of spirochætes in the fæces of soldiers. He examined both dysenteric and

non-dysenteric patients and found spirochætes in 56·5 per cent. of the former, and 41 0 per cent. of the latter. These results are of interest when compared with those obtained in West Africa, but it still remains to determine the prevalence of the infection in persons who have resided in temperate regions only.

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The Laboratory, Accra.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

CASE OF ACUTE DILATATION OF THE STOMACH FOLLOWING GASTRO-JEJUNOSTOMY.

BY FRANK GODFREY, M.B., C.M. EDIN.,
CONSULTING SURGEON, SCARBOROUGH HOSPITAL.

I RECENTLY operated on a patient, aged 23 years, who presented symptoms of pyloric obstruction, dating back for about four years. I found very marked stenosis of the pylorus, with scarring of an old prepyloric ulcer, and a moderately dilated stomach. There was also a diseased appendix bound down to the caput cæcum by old adhesions. I did a posterior gastro-jejunostomy, making the opening specially large, because of the increased size of the stomach, and removed the appendix. Beyond rather frequent vomiting, the patient showed no symptoms to cause anxiety for the first two days. She had nothing given by the mouth save small quantities of hot water and a little weak tea. On the third day the vomiting became more frequent, small quantities of watery fluid being thrown up, the pulse-rate increased, and the temperature fell to below 98° F. The patient complained of great weight in the abdomen, and she rapidly became "pinched" and collapsed. I then found a huge fluctuating tumour on the left side of the abdomen, extending down nearly to Poupart's ligament. Fearing that it was the transverse colon, which had possibly been returned twisted on itself, I opened the abdomen and found an enormously distended stomach, which I emptied. The contents were watery fluid, and represented in amount far more than the patient had had to drink. She died almost immediately.

Examination showed the gastro-jejunostomy opening to be patent, of large size, and perfect, and there was no discoverable "kink" or other obstruction in the efferent limb of the attached gut, which was empty.

I can only account for the condition as a paresis in a stomach weakened by chronic dilatation. Sir Berkeley Moynihan, to whom I related the case, told me that he had not met with a parallel one, but that he was told that exactly the same thing happens in animal experiments. One regrets that the deceptive vomiting and absence of serious symptoms prevented an earlier recognition of the condition.

Scarborough.

CASE OF INFLAMMATION IN A PERSISTENT PATENT MECKEL'S DIVERTICULUM SIMULATING APPENDICITIS.

BY ROBERT M. GLOVER, F.R.C.S. EDIN.,
ACTING SURGEON, ROYAL INFIRMARY, DUMFRIES.

THERE are no diagnostic distinctions between this form of diverticulitis and acute appendicitis. But immediate operation is necessary in acute appendicitis, and if the comparatively rare condition of acute diverticulitis (Meckel) is present it can be recognised and dealt with.

The patient, aged 27, was admitted to the Dumfries and Galloway Royal Infirmary on July 19th, 1915. He was referred to me by Dr. M. Bryson, Thornhill, with a diagnosis of acute appendicitis. There was a history of seizures on several occasions, each one being typical of acute appendicitis. On the present occasion he had apparently suffered from a similar attack, and Dr. Bryson advised immediate operation.

On examination the patient presented the usual signs and symptoms of an acute suppurative appendicitis, except that localised abdominal tumidity and tenderness were situated rather higher and nearer the middle line than usual. These points, of course, would not impress one that the case was other than an acute suppurative appendicitis with the appendix probably pointing upwards and inwards, and my own diagnosis therefore agreed with that of Dr. Bryson.

At operation, a few hours after admission, I opened into a localised abscess cavity with an extension downwards towards the pelvis, and fæcal-smelling, dark-coloured pus at once escaped. When the pus had been removed I observed a long tube lying free in the abscess cavity. The tube was about 7 inches long, rather thicker than an average appendix, had no mesentery, and originated from the ileum. About 1 inch from its intestinal origin it was dilated to the shape and size of a tangerine orange. The bulbous part was gangrenous, black in colour, stippled with greyish points. The intestinal ostium of the tube was about 1 inch in diameter. Distally the tube tapered away to a thin fibrous cord which disappeared backwards amongst adhesions. I did not identify the appendix, as I thought it unwise to disturb adhesions in any attempt to do so. But without doubt I was dealing here with a persistent, patent, inflamed, and gangrenous Meckel's diverticulum. I removed the diverticulum. The wall of the tube was quite sound for about half an inch from the bowel, and so the opening could be securely closed.

Recovery was uneventful, the patient being discharged from hospital in three weeks.

On examining the tube afterwards the dilated part was found to be full of thin fluid fæces, and the greyish points on the outer surface corresponded in position with small fæcal concretions adherent to the inner surface.

It was fortunate that a localised abscess had formed here. If that had not occurred, and operation had been at all delayed, rupture of the dilated part with copious extravasations of fæces would certainly have eventuated, and, according to statistics quoted by Jacobson, few of such cases recover—as might be expected.

Dumfries.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OPHTHALMOLOGY.

Exhibition of Cases.—Fur Infection of Human Conjunctiva from Cats.—Retinal Signs of Arterio-sclerosis Compared with those of Increased Blood Pressure.

A MEETING of this section was held on Feb. 7th, Mr. WILLIAM LANG, the President, being in the chair.

Mr. G. HARTRIDGE showed a drawing of a case of Probable Rupture of the Optic Nerve. The patient, a member of the Royal Flying Corps, suddenly fainted while flying and remembered nothing more until five days later. An observer said that in the last 500 yards of the fall the machine was vertical, and it was smashed. The airman sustained serious damage to the left arm and right eye. Apparently there was no skull injury. When seen three weeks after the accident extensive subconjunctival hæmorrhages were found in both eyes. In the right eye there was no perception of light, the pupil was widely dilated, and the vitreous was so filled with blood that no details of the fundus could be seen. There was a small wound of the upper lid. A small probe revealed no foreign body. The vision of the left eye was 6/5; fundus normal.—The PRESIDENT mentioned a similar case in a boy who had a clothe-prop poked into his eye.—Lieutenant-Colonel R. H. ELLIOT commented on the surprising escape of the patient from death, which was probably due to the brunt of the fall having been taken by one of the wings of the machine. He saw one man whose machine fell 150 feet, and all that could be seen was slight ecchymosis of the conjunctiva, and his pilot said he believed he had sprained his ankle!

Mr. H. B. GRIMSDALE showed a case of Congenital Absence of Choroid.

Mr. ARNOLD LAWSON read a paper on Fur Infection of the Human Conjunctiva from Cats, giving an account of three cases. The first patient was a girl of 15 years, who had a pet Persian cat which she fondled a great deal. One

day, after burying her face in its fur, her eyes became suffused and she had a severe sneezing fit. The next day the eyes were swollen, and a purulent discharge was exuding. The nostrils were also swollen, and purulent sanguineous matter was issuing from them. Cultures were made from the child's discharge and from the cat's fur, and *Staphylococcus aureus* was found in abundance. Energetic treatment resulted, without permanent damage to the eyes. The cat was, of course, destroyed. The second case was that of a boy aged 14 years, and was complicated and severe. A fortnight before Mr. Lawson saw the boy he had swelling of the left eye and of the glands of the neck, the local practitioner diagnosing mumps. It did not run the usual course of mumps; there had been no fever or pain. When seen there was a brawny swelling over the parotid and into the neck, and the lids of the left eye were considerably swollen, with inflammation of the conjunctival surface of both tarsi. A muco-purulent discharge was exuding from the furrows of the swollen tissues. Tubercle seemed improbable on account of the rapidity of the development. The boy had been in the habit of walking about with his pet Persian cat perched on his left shoulder and cuddling it. The patient was anæsthetised and the condition treated by cutting, scraping, and swabbing with 2 per cent. silver nitrate. Six weeks' treatment was required and the glands did not subside for three months. The scrapings were cultivated and revealed *Streptococcus longus*, *Streptococcus brevis*, and *Staphylococcus albus*. A dog in the house and the cat were examined, and the latter was proved to be the culprit. The third, and most severe, case was that of a girl aged 5 years, who was staying with friends at a farm. She developed muco-purulent conjunctivitis of a mild type after nursing a favourite cat, which divided its attention between the house and a cowshed. After a time the neck glands were involved in a serious degree. The upper lid showed an exuberant mass of cock's-comb granulations, especially on the retro-tarsal tissue. He suspected conjunctival tubercle. He cut and scraped away all the infected parts, and treated the residue with mitigated nitrate of silver stick. An excellent recovery ensued after three small operations in the course of the next three months. There had been no recurrence in eyes or glands. Mr. Browning pronounced it to be the bovine type of tubercle bacillus. Scrapings injected into a guinea-pig resulted in rapid wasting, and death within a fortnight. The owners refused to allow the cat to be examined. Mr. Lawson pointed out how great a danger cats were in this respect, especially among children, though, because of its habit of licking itself, and thus distributing its saliva, it was popularly regarded as a cleanly animal.—Mr. M. S. MAYOU remarked that tubercle was a common disease among cats.—Dr. ETTIE SAYER referred to a case of tuberculous infection of the eye from a pet dog.

Mr. P. C. BARDSLEY read a paper on the Retinal Signs of Arterio-sclerosis Compared with those due simply to Increased Blood Pressure. The late Mr. Marcus Gunn, in Vol. XVIII. of the Ophthalmological Society's Transactions, published his great work on the retinal signs of arterio-sclerosis, and since that date but little had been added. The four cardinal signs therein laid down were: (1) a tendency to tortuosity of the arteries, especially smaller vessels; (2) variation in the calibre of the vessels, especially sudden diminution over a short length; (3) alteration of the normal light streak, which became brighter and more sharply defined; and (4) indentation of veins. Sometimes the changes developed rapidly, especially after influenza, scarlet fever, or other toxæmia, vision being at the same time reduced to 6/12. Mr. Bardsley said he could not believe that advanced fibrosis could have occurred in a day or two. Lowering of the blood pressure brought about an improvement in the appearance and cessation of the headaches which accompanied the high pressure. He submitted that the following were the indications of simple high tension without real arterio-sclerosis: (1) the vessels appeared to be *uniformly* distended; (2) the light reflex was broadened out, and might apparently reach the whole width of the vessel; (3) the light streak was increased, but did not look like silver wire; and (4) the tight arteries indented the veins deeply in very high tension, leading to back pressure. He concluded by pointing out the pitfalls of which persons unskilled in the use of the ophthalmoscope might not be aware.—Mr. HERBERT PARSONS referred to the recent work on the subject by Mr. Foster Moore.—Mr. J. B. LAWFORD said he was a colleague of the late Marcus Gunn when he was making investigations. Since that time his observations convinced him that the prognosis in these cases was not always as bad as Mr. Gunn considered. He had seen a number of cases—some of them having been under Mr. Gunn's care—get much better. There were ophthalmoscopic changes, not very different from those of arterio-sclerosis, which had not nearly the same grave significance as those of the actual disease.—Mr. D. LEIGHTON DAVIES said that in examining a number of old people in Cardiff Workhouse he was struck by the very slight signs of retinal arterio-sclerosis. The most pronounced and constant sign was redness of the disc. He seldom saw any marked indentation of veins, although the systolic pressure was often over 200 mm. and the diastolic 140 mm. He found it very difficult to give a prognosis as to the duration of life in these cases.

Reviews and Notices of Books.

Formes Cliniques des Lésions des Nerfs.

By Mdme. ATHANASSIO-BENISTY. Paris: Masson et Cie. 1916. Collection Horizon. Pp. 240. Price 4 fr.

A PREFACE by Professor Pierre-Marie introduces the author of a well-written and useful treatise on nerve injuries. Commencing with a brief description of the methods used in a routine neurological examination of a limb, the various forms of injury met with in their clinical aspects are systematically described, the text being fully illustrated by numerous excellent photographs and diagrams. A further second volume on treatment and restoration of function of nerves is promised as a sequel.

We note that in the description of the examination of nerves by electro-diagnosis of the paralysed muscles no mention is made of the use of condenser currents, which has recently become a favourite method with several practitioners in this country, who assert that it provides a more accurate and certain means of determining the exact condition of the damaged nerve than the older and well-tried methods of faradism and galvanism. A sound chapter is devoted to the discussion of painful injuries of the nerves, when reference is made to the fact, well known to all who have worked in neurology during the present war, that the median and internal popliteal nerves suffer particularly in this way. The author suggests as accounting for this fact, that the palm of the hand and the sole of the foot are the cutaneous areas supplied by these two nerves, and that they are the two areas above all others which are liberally provided with touch corpuscles and similar end-organs for sensory stimulation. These painful affections of the hand and foot were named by Weir-Mitchell long ago "causalgia," and over the derivation of the word the author's Greek fails her. The burning pain in the hand, with bursting tearing sensation in the finger-ends, is well described, as are also the accessory factors that will start or aggravate the paroxysms of pain, such as dry heat, scraping noises, coughing, sneezing, laughter, and most sudden emotions, Madame Athanassio-Benisty omits to mention what in our experience is the worst enemy of sufferers from causalgia—in military hospitals, at least—namely, the gramophone. The pain usually reaches its maximum some few days or weeks after the injury, though some pain dates from the moment of the wound. The hand or foot often sweats profusely and is hot and reddened, or even cyanotic, while the application of cold water and keeping the limb raised relieve the pain. Atrophy of the whole hand, skin, muscles, and the finger pulps, with incurving bridged nails are evidences of the trophic damage, while skiagrams exhibit an osteoporosis of the bones of the hand or foot. This painful trophic condition never occurs with severe lesions of the nerves, and anæsthesia is always very slight if present, while operations on the damaged nerves have shown only slight compression by fibrous scar or congestion and œdema of the nerve. Surgical interference rarely relieves, though alcohol injection of the nerve above the lesion may give excellent results. The pathology of the condition has been suggested to be due to an associated vascular lesion in the arm or leg, but this cannot be the case, for injuries at a distance from any vessel of importance may produce the disease. The author considers that we may be dealing with a neuritis of the sympathetic branches accompanying the nerve-

trunks. The lesions of the brachial plexus are fairly fully dealt with as regards motor and sensory paralysis; nothing is, however, said of operative procedure. This, in our experience, is rarely of any real value in injuries of the plexus from bullet wounds, owing to the large amount of scar-tissue which cannot be prevented from re-enveloping the nerves.

Full accounts are given of the anatomy of the sciatic nerve and its injuries, with excellent figures of the cutaneous nerve-supply of the lower limb, while lesions of the lumbo-sacral plexus and a description of cranial nerve injuries complete a useful and carefully written volume.

Care and Feeding of Infants and Children.

By WALTER REEVE RAMSEY, M.D., Associate Professor of Diseases of Children, University of Minnesota, U.S.A. With 123 illustrations. London and Philadelphia: J. B. Lippincott Company. 1916. Pp. 290. Price 9*s.*

THIS work is primarily written for nurses, but, in this country at least, it is well adapted for use by average health workers, and among them it should become popular, for the reason that greater notice is given to the preventive side of medicine than to the curative. Pathology, diagnosis, and treatment by drugs find little place in this volume; but when occasion warrants, sufficient attention is paid to these scientific aspects of medicine to make the rationale of professional management clear to the nurse.

The lines of management suggested in these pages agree very closely with those now taught in our well-conducted welfare centres; and the author shows himself to be commendably free from fads and fancies, but by no means adverse to the giving of "tips," if the expression is permissible, for nursing and sick-room technique. His suggestions for improvising means for collecting specimens of urine in the case of young infants, for strapping the protuberant umbilicus, for the breast-feeding of weakly infants, and so on, are excellent. We cannot, however, agree with his view that an adherent foreskin had better be left alone in the hope that it will right itself. There are naturally degrees and varieties of adhesions, but the *laissez-faire* policy is not a good one. On page 55 we notice views on the question of mouth-breathing in infants to which we cannot altogether subscribe. The author claims that mouth-breathing in quite young infants is due to the presence of a large post-pharyngeal tonsil. We submit that it very seldom starts in this way; in young infants the adenoids are more often the necessary consequence of mouth-breathing. The author, in our opinion, greatly understates the possible sequelæ of painful dentition. He says the teeth are always growing, therefore exacerbations of symptoms are wrongly ascribed to teething; but if there is one thing that is quite clear about the growth of teeth it is that it is subject to pauses and periods of accelerated development. On page 87 we notice the old fable that during the siege of Paris infant mortality was low; recent evidence proves that the mortality during this time of anxiety was enormous. In more than one connexion the author refers to the condition of tongue-tie as if it were an abnormality due to peculiarities in the growth of the frænum linguæ; surely the shortness of this fibrous structure is generally, if not always, due to some incapacity on the part of the infant to extrude the tongue—namely, in some want of neuro-muscular coördination. If the tongue can be, and is, properly extruded the frænum grows in accordance with the requirements. These are, however, minor matters, and on the thoroughly good common sense and rational advice offered for the management of infants and children we congratulate Professor Ramsey.

Clinical Bacteriology and Hæmatology for Practitioners.

By W. D'ESTE EMERY, M.D., B.Sc. Lond. Fifth edition. London: H. K. Lewis and Co. 1917. Pp. 310. Price 9*s.* net.

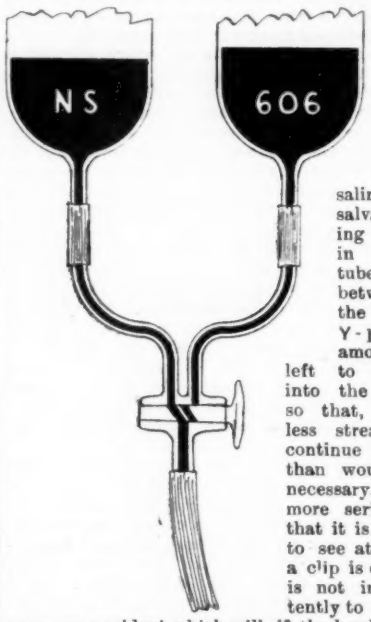
THE late Sir Michael Foster once warned a friend never to write a text-book, as "if it is a success, it is a millstone around your neck for the rest of your life." Dr. Emery will assuredly carry his millstone so long as he continues to provide the practitioner with the lucid and up-to-date information contained in this book. In this edition he has gone a little beyond what the peace time practitioner requires, and has included such things as Dreyer's method of agglutination with the Oxford Standard Cultures and McIntosh and Fildes's method of complement fixation; this is a good departure, as it is wise for every medical man to understand the principle of these important tests. It is also open-minded, as Dr. Emery does not himself believe that it is necessary to add complement at all for the Wassermann reaction. Many recently qualified men have acquired a turn for laboratory methods which will, it may be hoped, never leave them, and they will find these inclusions of considerable service to them. The value of a book of this kind opens up indeed an interesting question of medical politics. The surgeon uses the operating theatre, speaking roughly, as his workshop to verify the opinions given in the consulting-room, and the physician of the future will do something to equalise his opportunities if he has a handicraft of his own. Probably this was in Sir Clifford Allbutt's mind in winding up a recent discussion on the relation between physician and surgeon. Dr. Emery's book is an excellent guide to the physician's handicraft.

New Inventions.

IMPROVED APPARATUS FOR INTRAVENOUS INJECTION.

WHAT is known as the "military" apparatus for intravenous injection has met with much favour. It has, however, some minor disadvantages, which are, I think, remedied in the modification shown below.

In the usual arrangement the two graduated barrels for normal saline and salvarsan respectively are connected with the arms of a glass Y-piece by two lengths of rubber tubing each bearing a metal clip. When the dose of salvarsan has been run off from its barrel, one closes the clip of that side and opens the other to let the normal saline wash out the salvarsan still remaining in the tube. But in the portion of tube that intervenes between the clip and the junction of the Y-piece a certain amount of salvarsan is left to diffuse gradually into the flowing saline; so that, to get a colourless stream, one has to continue the saline longer than would otherwise be necessary. A second, and more serious, objection is that it is by no means easy to see at a glance whether a clip is open or closed. It is not impossible inadvertently to leave both open at once—an accident which will, if the levels of the liquids in the barrels are different, lead to a mixture of the two fluids, with the result that the whole of the material will be wasted.



To overcome these difficulties I had a special glass Y-piece made with a three-way tap at the junction. The arrangement will be easily understood from the diagram, which shows both fluids as dead black. In the position illustrated the normal saline is flowing. It is evident that if the tap is turned through two right angles the saline will be cut off and the salvarsan will flow. In any intermediate position both are cut off. Mixture of the two fluids is thus impossible. Then when the change from salvarsan to saline is made, there is no reservoir of salvarsan to contaminate the saline. There is besides a small gain in the fact that one movement effects the change of fluids.

An experience of some months convinces me that this little device, which has been made for me by Messrs. Baird and Tatlock, Charles-street, Hatton Garden, E.C., does, to an appreciable extent, make for efficiency and convenience; and I therefore think it worth description.

W. R. K. WATSON, M.A., M.B. Glasg.,
Medical Officer, H.M. Prison, Wormwood Scrubs.

THE LANCET.

LONDON: SATURDAY, MARCH 3, 1917.

The Mobilisation of the Medical Profession.

FROM previous articles which have appeared in these columns it must be apparent to our readers that a very important, if not critical, position has been reached in the medical profession with regard to the supply of doctors for the Army. At least three months ago it became obvious to many that the question whether the medical profession should or should not mobilise itself voluntarily was urgent, and how rightly the situation has been gauged was proved more recently by the statement of the Prime Minister, who, when speaking of the responsibility now lying upon the whole population for active prosecution of the war, intimated that where voluntary mobilisation in any section of that population did not fulfil expectations compulsory powers would have to be sought. The intention of the present Government to ensure that every man in the country during these our critical times should give his help, how, when, and where best qualified was thus openly avowed. Therefore, and immediately on the creation of the National Service Department, Mr. NEVILLE CHAMBERLAIN, the Director-General of that Department, was approached by the Central Medical War Committee, the Committee of Reference of the English Royal Colleges, and the Scottish Medical Service Emergency Committee with a view to an early interview. It was felt that a joint representation should be made as promptly as possible to the Director-General by the three statutory bodies upon whom the double duty had devolved of keeping up the necessary supply of medical officers for the Navy and Army and of watching lest the civilian population should be dangerously depleted of professional assistance. In the event the Scottish body was not present at the interview, which was duly granted, but the Director-General has since been placed in possession of its opinions.

Early in February Mr. NEVILLE CHAMBERLAIN made a statement as to the direction in which his plans might be expected to mature, so as to obtain from the general population services of all kinds, and in the course of this statement, referring to medical men, he said: "We have to see that the doctors are so mobilised and distributed that the needs of both the civil population and the Army can be met, and that, so far as possible, specialists can be put to do the work for which they have taken pains to fit themselves." This was to a great extent the object which the three statutory bodies had set before them, and it was felt generally that Mr. NEVILLE CHAMBERLAIN could practically carry out his plan of campaign, as far as the medical profession was concerned, by availing himself of the existing organisations, with their considerable experience and accumulated stores of information. The Director-General of the National Service Department has now written to the three statutory bodies saying that as the organisation of the medical profession, with a view to meeting the needs both of the military and civil population is one with which his department is concerned, he desires to have a conference with their representatives. "Up to the present," he adds, "the work of providing the Army with qualified medical men has been undertaken by the Central Medical War Committee with the assistance of the Committee of Reference for England and Wales and the Scottish Medical Service Emergency Committee. It is clear, therefore, that in considering what further steps should be taken these bodies should be consulted and their opinions fully considered. Accordingly, I have decided to call a conference comprising three representatives of the Scottish Medical Service Emergency Committee, four from the Central Medical War Committee, and two from the Committee of Reference, over which I have asked Sir DONALD MACALISTER, the President of the General Medical Council, to preside." The statutory bodies are asked to nominate representatives from amongst their number to attend the conference, when the problems that have been presented frequently in these columns will be discussed, beginning with the vital question of whether the service to be rendered by members of the medical profession should be voluntary or compulsory. The three statutory bodies have pronounced so far in favour of the view that sooner or later some form of compulsory arrangement will be found to yield the best and fairest results.

At a conference held recently of the committee and the secretaries of the Local War Committees for Scotland a resolution was adopted unanimously affirming that further substantial calls are likely to be made on the medical profession which can only be met by mobilising the whole profession. But the issues in Scotland are less complicated than they are in England, where the redistribution of medical men, centrally or locally, must often be a matter of extreme difficulty. The financial aspects of national service for medical men in many parts of England will require very careful handling, whether we consider whole-time or part-time work; and the sacrifice of the medical man who holds a commission with its dangers and emoluments must be fairly compared with that demanded of the civilian medical man under all forms of substituted practice. Because the considerations that will here arise are so many and may be so delicate, we welcome Sir DONALD MACALISTER as chairman of the Conference proposed by Mr. NEVILLE CHAMBERLAIN. The President of the General Medical Council has acquired by his long connexion with the Council an unrivalled knowledge of our professional life, and in any discussion under his guidance no room will be found for irrelevancies, while the minimum of time will be spent in explanations of the unimportant, or repetitions of the well-known. It is hoped that there will emerge from the Conference a plan of campaign and the necessary authority to secure its working.

The Restitution of the War Cripple.

As the war drags on, and the possible shortage of supplies of all other kinds gives rise to anxiety, the supply of maimed and crippled men continues unabated and the problem of their restitution becomes a larger and larger one. Something of the magnitude of the problem has now been realised by the authorities, and the chief stumbling-block to its effective solution lies in the conflicting destinies of the two main groups of disabled men: those whom treatment can restore to efficiency as a fighting unit, and those whose military value no longer exists but whom it would be base ingratitude not to restore to the highest possible grade of civilian efficiency. Stated thus on paper, the division appears to be a precise one, and one for which arrangements could readily be made, dealing with the group of disabled but restorable soldier in the military hospital and convalescent camp, and providing immediate discharge of the non-restorable soldier for treatment and re-education as a civilian worker. In practice the distinction has so far been found quite impossible to make. Many apparently minor conditions prove unamenable to treatment and lead to ultimate discharge from the Service, while grave disabilities—short of blindness, deafness, and injuries requiring amputation—under patient and appropriate treatment have not prevented a return to military efficiency. Nor has the difficulty of distinguishing the two groups been attended with any serious drawback to either class. Whatever the ultimate result of treatment may prove to be, the same medical care, the same physical means, and the same moral control are the curative factors in both cases. Further than this, the particular methods of manual training desirable for civilian efficiency have been increasingly found to be more curative than ingenious exercises designed to produce the correct quality and quantity of muscular movement, but devoid of useful concrete results. The apparatus may be physically perfect; the manual training has psychic factors which are essential.

Take, for example, the life of a man who has to stay some months in a Command Depôt after his wound or his shock has allowed him to leave the Military Hospital. He rises at 6.30 A.M. and goes to bed at 10 P.M. or later. His treatment may occupy half an hour daily, his physical training another half hour, route-marching an hour more towards the latter part of his stay. Much spare time remains for the flesh and the world, if not the devil, to appropriate. How can this man's time—whatever his immediate future—be better employed than in learning something which will be useful to himself and his country, provided, of course, that the learning does not interfere with his treatment? The problem is one that has had to be faced in all combatant countries, and it may not be amiss to record the official German attitude, as shown in the remarks of a lecturer at a course of military medicine at Düsseldorf. "We could not," he says, "have foreseen in peace times the tremendous importance of employing, besides purely medical methods, special means to occupy the sick and wounded in hospital in order to accustom them again to work and send them back more readily to their occupation. Repeated and detailed instructions have been issued on this point. The sick and wounded are not to be discharged from the Service until they have reached the highest possible degree of recovery of function. In view of the prolongation of treatment thus entailed it is essential to protect the inmates of hospital beds from long months of idleness which may make them more or less work-shy, quite apart from the fact that in many cases appropriate manual training is directly designed to assist their cure and to assure the attainment of what I may term the social aim of treatment. Experience shows that many men require a certain external pressure to keep them at actual work, even though this is light. The appearance of compulsion must, of course, be avoided, and the aim be to lead them by easy stages to more useful and arduous work, finally bringing them to the point of finding real enjoyment in their recovery of working ability." The important work of the Military Hospitals Commission in Canada, recorded in the Third Bulletin,[1] dated December, 1916, emphasises the same essential point of view. The disabled Canadian is to be made, physically and mentally, as efficient as possible while still under military oversight.

Such being the essentials for the war cripple's restitution, there must be some well-considered reason for the issue of an Army Council instruction to discontinue workshops and the teaching of trades and occupations in military hospitals, camps, and depôts, an instruction which was—as we noted last week—described by Lord H. CAVENDISH-BENTINCK in the House of Commons as a retrograde and reactionary step. It is impossible that the Army Medical Service does not recognise the value of such workshops and teaching, and the explanation can hardly be other than that the provision of these essential things in some different way is in contemplation. Methods and technique require some backing of authority and discipline to be fruitful of result, and discipline must remain an essential part of any effective scheme. The statement and recommendations just issued by the Committee of Council of the Section of Balneology and Climatology of the Royal Society of Medicine, which we print on p. 348, come at an opportune moment. The committee express the hope that the problem is now approaching a solution. They see the necessity of an adequate and well-ordered system of physical treatment for every disabled soldier before his discharge from the Service. They regard physical treatment as the thing most needed to prevent the formation of an army of cripples in this country. And they recommend the establishment throughout the country of centres of physical treatment on an adequate scale and wherever possible in association with general hospitals, so that other forms of special treatment and diagnosis may be readily available, and in close association with centres of re-education. Whatever the solution decided upon the problem brooks no delay.

[1] Military Hospitals Commission Bulletin, 22, Victoria-street, Ottawa, Canada.

Annotations.

"Ne quid nimis."

THE SUPPLY OF MEDICAL STUDENTS.

WE have received from the General Medical Council the following tabular statement showing the number of students in actual attendance on courses of instruction in preparation for medical degrees or diplomas:—

January, 1917.

Topical distribution.	First year qualifying in 1921.			Second year qualifying in 1920.			Third year qualifying in 1919.			Fourth year qualifying in 1918.			Fifth year qualifying in 1917.		
	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.
London (only)	217	174	391	183	133	316	71	54	125	229	44	273	425	51	476
England	602	325	927	374	210	584	175	99	274	341	68	409	539	78	617
Scotland	366	239	605	235	184	419	180	131	311	314	74	388	359	71	430
Ireland	481	110	591	378	78	456	217	31	248	194	22	218	190	15	205
Total	1449	674	2123	987	472	1459	572	261	833	851	64	1015	1088	164	1252

May, 1916.

London (only)	251	122	373	145	68	213	43	44	87	479	39	518	269	38	307
England	558	226	784	280	109	389	140	65	205	619	71	690	375	55	430
Scotland	404	311	715	267	154	421	213	80	293	258	55	313	366	74	440
Ireland	460	99	559	36	32	268	166	18	184	201	19	220	181	11	192
Total	1422	636	2058	783	296	1078	519	163	682	1078	145	1222	922	140	1062

The total number of students in attendance in May, 1916, was 6103. The total number of students in attendance in January of this year was 6682.

THE ULTIMATE RESULTS OF SANATORIUM TREATMENT.

ALTHOUGH the War has deprived the King Edward VII. Sanatorium at Midhurst of its medical superintendent and its pathologist, partial compensation, as the report for the year 1915–16 shows, has been provided by a grant made on the recommendation of the Medical Research Committee in aid of the statistical researches carried out at the sanatorium. As is well known, the primary difficulty in regard to all extensive statistics of sanatorium results is that so many patients are lost sight of after the first year or two following on their treatment. With the employment of a special officer to follow up these cases the gratifying result has been achieved that a greater number have been traced in the last year than at any time previously. This has the curious result in the tables that more patients of a certain past year are "well" or "alive" in 1916 than was the case in 1915 or 1914. An improved system of investigation has redeemed them from the ranks of the "lost sight of" and has thus enhanced the reputation of the treatment they had received. Taking the first complete year, 1907–08, in which the sanatorium had its full complement of patients, and tracing the history of the 206 patients discharged during this period whose sputum gave positive result in the sanatorium, 71 were known to be "well" or "alive" in 1913, and 70 of these were still alive in 1916. Picturing this result in the form of a curve we note that the numbers still living in each successive year after discharge rapidly fell for five years, to remain level for the next years, and, we may presume, indefinitely. The observation is practically the same whatever the severity of the disease was at the time of treatment. Naturally a smaller proportion of the advanced or Group 3 cases survived, but the deaths occur within five years of discharge, and the statistics suggest that after having survived his course of treatment for five years the tuberculous patient has a good prospect of continuing to live indefinitely, whatever was the condition of his lungs at the time of his cure.

THE INTRAVENOUS ADMINISTRATION OF QUININE.

UNTIL the extermination of the mosquito is complete quinine must continue to hold its place in malarial countries as a prophylactic and curative agent, and in cases in which it is not tolerated by the stomach, or it is desired to obtain an immediate and powerful effect, the intramuscular or intravenous administration has to be considered. Intramuscular injection is painful and may give rise to points of local necrosis, but is generally held to be safer than the intravenous route, although in either case the injection of tetanus spores should not be lost sight of. Speaking from a very large experience amongst African troops during 1915, M. Braun, director of the Marocean Service de Santé, states[1] that ampoules containing 0·4 gm. of quinine hydrochloride in 1 c.c. of excipient, being non-isotonic and caustic, are liable to cause abscess at the site of intramuscular injection. Baccelli, who employed intravenous injection with much success in pernicious cases of malaria, used a solution made up as follows: Quinine hydrochloride, 1 gm.; sodium chloride, 0·75 gm.; distilled water, 10 gm. Apparently the fear of producing clotting in the vein is the chief drawback to this method, and in a paper[2] by Captain A. C. MacGilchrist, I.M.S., this risk is fully considered, as well as the possible production of hæmoglobinuria. Captain MacGilchrist concluded by advising a very dilute solution for intravenous use—viz., 7 grains of bi-hydrochloride in 2 to 3 pints of saline fluid. The work of three physicians, Dr. German Arellano, Dr. F. G. Miranda, and Dr. Fausto Robleto, at the San Juan de Dios Hospital in Granada, Nicaragua, suggests that Baccelli was right and that concentrated solutions of quinine can be injected safely into a vein. They have gone even further and find that the solution need not even be isotonic with the blood serum. Dr. Arellano and his colleagues speak of being daily confronted during the rainy season with rapidly fatal forms of pernicious malarial fever,[3] and have found nothing so efficacious in the face of impending death as the intravenous injection of quinine. Concerning its administration they write:—

The first time that we employed this method with the happiest and most successful results, we were able to use Parke Davis and Co.'s solution of quinine in sodium chloride and other salts; but unable to obtain the isotonic ampoules, we had no choice but to use the acid non-isotonic solutions of the chloride, bichloride, and chlorhydro-sulphate of

[1] Le Paludisme au Maroc en 1915, Arch. de Méd. et de Pharm., November, 1916.

[2] THE LANCET, 1911, i., 1221.

[3] Whitaker's Almanack, with unconscious humour, gives the population of Nicaragua as 600 000, "of whom about three-quarters are mixed blood and the rest Indians, *besides the Mosquitos, who are mostly in a savage state.*" [The italics are ours.]

quinine, as supplied in ampoules by Parke Davis and Co., Clin of Paris, and others, diluted with an equal volume of warm sterile water. The results are simply marvellous and we have never had the least trouble or accident. So sure, safe, and efficient do we consider this method to be that we employ it now even in cases showing no signs of perniciousness. The patients merely complain of tinnitus, deafness, transient nausea, and a sense of heat spreading all over the body within one to ten minutes after the withdrawal of the needle.

In all cases of pernicious fever we have found the worst symptoms, such as amaurosis, convulsions, algidity, and collapse, to disappear from three to six hours after the injections, though cases have occurred in which the patient was out of danger within the hour. The dose we employ is from 10 to 25 or even 50 centigrammes, according to the age, state, condition, and symptoms of the patient. Children are also subjected, when the veins are accessible, to the same treatment. In fact, in children it works wonders. Now, as it may be asked why we have not used Baccelli's formula, we will frankly state that in this town there are no pharmacies really reliable in which such solutions might be aseptically prepared, a fact which has led us to give preference to solutions which, acid though they be, are most certainly aseptic and exactly dosed. The technique we employ is as follows: We mix the solution within the syringe with an equal amount of sterile warm water, taking care that no precipitate or coagulum is formed as the blood comes in contact with the solution. It has been observed at times, especially when time is lost in inserting the needle, that a kind of flocculent precipitate is formed very similar to that of "aluvine" when injected intravenously; but, as in that case, experience has shown it to be perfectly safe, it being a sort of emulso-suspenoid.

The authors add that at first their procedure was severely criticised by their local colleagues, and in the daily press, until continued experience showed its safety. They offer no explanation of the non-coagulability of the blood by the acid non-isotonic solution, but commend other workers to test the fact for themselves.

INTESTINAL OBSTRUCTION DUE TO ASCARIDES.

Dr. J. M. Perret and Dr. H. T. Simon have reported in the *Journal of the American Medical Association* of Jan. 27th a case of intestinal obstruction due to a very unusual cause—a mass of round worms. During the latter half of the nineteenth century opinion was divided as to the possibility of ascaris lumbricoides being the cause of intestinal obstruction. Thus, Leichtenstern and Sir Frederick Treves opposed this view, while Trousseau, Bretonneau, and Stutz upheld it, each having been among the first to report cases. Bordoroni and Stepp in 1887 reported two cases, both of which were confirmed post mortem. Simon in 1892, while holding a necropsy in a case of intestinal obstruction, found the cause to be a mass of round worms. Botoff in 1897 reported a case of obstruction, perforation, and peritonitis, in which the necropsy revealed the presence of 500 round worms. An American surgeon, Van Meter, reported the case of a child, aged 5 years, with a sausage-like mass above and to the left of McBurney's point in which operation revealed in the lower part of the ileum a coil of round worms causing complete obstruction. The patient recovered. In this country Mr. D. H. Vickery reported the case of a woman with symptoms of intestinal obstruction and a history of vomiting several round worms. After a dose of santonin, followed by castor oil, she vomited 12 round worms. The symptoms of obstruction disappeared, and excepting for the sudden termination of gestation she made an uneventful recovery. Dr. Perret and Dr. Simon report the following case. A girl, aged 8 years, was sent to hospital for operation with the diagnosis of acute intestinal obstruction. The family history was of interest, as the patient's five sisters and brothers had passed round worms on many occasions. The child herself had frequently passed round worms since the age of 2 years. Five days prior to admission she was seized with a pain in the right lower abdominal quadrant, accompanied by slight elevation of temperature. On the second day she began to vomit clear watery fluid, and this continued up to the time of admission. A dose of castor oil was given the second day, but only a small stool was passed. On admission the temperature was 101° F. The child was poorly developed and nourished. The skin was of a slight sallow tint. The glands in neck and groin were enlarged. The eyes were sunken, with dark hollows under the orbits. The tongue was dry and coated. Coarse mucous râles were heard over the lower half of the right lung, both anteriorly and posteriorly. The abdomen was distended and tympanitic. In the left lower abdomen, in the region of the sigmoid, a mass the size of a large lemon was felt. An enema was given, and returned coloured with fæcal matter and containing a mass the size of a child's closed fist consisting of approximately 40 round worms, coiled and interwoven together. A second enema was given, and returned highly coloured with fæcal matter. The distension was relieved, and excepting for a rise in temperature for 8 hours the patient improved, and in 12 hours the temperature was only 99·6°. She continued to improve, and except for an acute bronchitis, which she developed about the seventh day, recovery was uninterrupted. Most cases of intestinal obstruction due to round worms have been diagnosed at the necropsy or on the operating table. Only seldom has the mass of worms been expelled through the natural channels, as in the present case.

PROHIBITION AND THE DRINKING OF METHYLATED SPIRIT IN RUSSIA.

IN recent discussions on the drink question reference has frequently been made to certain untoward results which are alleged to have followed the prohibition of the sale of vodka in Russia, the most serious of these results being the increasing use, in lieu of the prohibited beverage, of such dangerous substitutes as methylated spirit and varnish. The extent to which this pernicious practice has developed is, from the nature of the case, somewhat difficult to determine, but that it is sufficient to justify considerable anxiety is clear from the rise in the number of deaths from alcoholism in the larger towns, and also from the increasing frequency of cases of toxic amblyopia due to methyl alcohol poisoning since the enforcement of the new policy. In his "Self-Discovery of Russia" (Constable and Co., 1916) Professor J. Y. Simpson quotes some striking data referring to both these points from a report on "The Results of Compulsory Prohibition and New Forms of Drunkenness," made by Dr. Alexander Mendelson to the Russian Society for the Preservation of National Health in March, 1915. Dr. Mendelson gives the number of deaths from alcoholic poisoning in the Obukhov City Hospital of Petrograd for the several months from July, 1914, to March, 1915, as follows: 52, 25, 27, 29, 33, 46, 56, 53, 36. The higher rates in the later months coincide with a great increase in the sale of denatured spirit and with a rise in the number of methyl alcohol drinkers in the hospitals. In the Eye Hospital in Petrograd there were treated 72 cases with impaired vision due to this specific

cause from July, 1914, to April, 1915. Previously such cases had been quite insignificant in number. Dr. Mendelson, who is a strong supporter of the prohibition policy, is of opinion that methylated spirit-drinking is practically confined to persons who were already of confirmed alcoholic habits, but this view appears to be disputed by other medical authorities. Thus, in the Russian Supplement of the *Times* of July 28th, 1915, extracts are given from an article contributed to the *Russky Wratch* by Dr. Novosolsky, in which the writer affirms that the use of methylated spirit and other substitutes is spreading amongst all classes of the population who formerly drank vodka, and this opinion appears to be in some measure confirmed by the observation that the alcoholics treated at the Obukhov Hospital for methyl alcohol and varnish drinking include persons of all ages and professions. The Russian Government is fully alive to the danger of this new drug habit, and is endeavouring to combat the evil by bringing the sale of denatured spirit under stricter control and also by adopting more effectual methods of rendering such spirit unfit for use as a beverage, but no evidence is as yet available to show to what extent these measures have proved successful.

THE PROGNOSIS OF GUNSHOT WOUNDS OF THE ABDOMEN.

LAST year at the Swiss Surgical Congress Professor Sauerbruch narrated his surgical war experiences in Germany, and as the text of this lecture has now come into our hands we may expand with advantage the summary[1] already given of his remarks on the treatment of gunshot wounds of the abdomen. Sauerbruch is convinced of the necessity of immediate operative interference in all gunshot wounds of the abdomen in which the peritoneum is involved, and believes that when this necessity is generally recognised the arrangements for carrying out the operations will readily be improvised at the front. He regards the external circumstances—the operation-room and the appurtenances of a theatre—as in general vastly overrated, holding that correct diagnosis, followed by immediate and technically correct operating, is the only factor which seriously counts. He refuses to speak, as is often done, of hopeless operations, in view of the consistently good results of early operation. It cannot be too much emphasised, he adds, that men who recover after abdominal injury retain an undiminished capacity for living and for working and do not swell the ranks of the war cripples. Sauerbruch therefore regards the operative treatment of gunshot abdominal wounds as precisely the most encouraging field of action for the military surgeon.

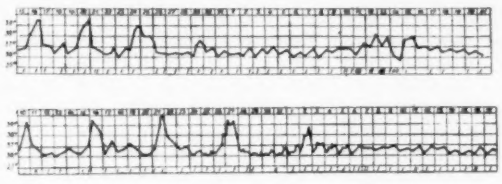
IDIOPATHIC DISLOCATION OF THE EYEBALL.

Dr. David M. Greig, of Dundee, records in the *Edinburgh Medical Journal* (Vol. XVIII., No. 2) a case of idiopathic dislocation of the left eyeball in a female child aged 11 months. The child was a neglected and badly nourished child weighing only 7 lb. There was no proptosis except when the child had screaming fits. Both eyes were then proptosed, the left more than the right, and on these not infrequent occasions the left eye often became dislocated forwards between the lids. It could not be retracted voluntarily, but was easily replaced by gentle pressure. Dr. Greig has been unable to find any record in the literature of spontaneous dislocation of this nature, but we doubt if it is quite so rare as the absence of published cases would seem to indicate. In cases of extreme proptosis accompanying exophthalmic goitre dislocation forwards between the lids occurs very readily, and the same is true in some cases of oxycephaly, in which the orbits are very shallow. We have seen cases of this type of dislocation associated with very slight traumatism, where, indeed, the injury has been so trivial that one is inclined to attribute the displacement to the effects of sudden fright. In our experience these cases have always occurred in children; there has been practically no injury to the eye, which has been replaced in the orbit with the greatest ease.

[1] THE LANCET, 1916, i., 634.

ANOTHER SPIROCHÆTAL DISEASE.

EARLY in 1916 a febrile disorder was described by Werner and Haenseler as occurring on the German Eastern front, and named by them five-day fever or febris quintana, and by later observers febris wolhynica. In the summer of 1916 a number of similar cases occurring on the Western front were known as Meuse fever. A paper by Dr. W. Thörner in the *Münch. med. Wochenschr.* for Dec. 12th last gives a concise account of the disease with two charts—which we reproduce—showing



the characteristic course of the temperature. Put briefly, the characteristic symptoms are: Sudden elevation of temperature without rigor, and defervescence without sweating; acute pain in the legs often requiring morphia, but without definite evidence of periostitis; an enlarged spleen sensitive to pressure; heart, lungs, digestion, and urine normal; polynuclear leucocytosis up to 20,000. The symptoms described need not be reproduced in greater detail, as they correspond exactly to the description of trench fever on our own front given by Dr. A. F. Hurst in THE LANCET of Oct. 14th last. The resemblance between the temperature charts given by the different authors is very striking. The German observers have devoted much attention to discovering the exciting cause of the fever. Werner thought he saw on one occasion a spirochæte rather longer than the diameter of a red cell. Korbsch saw dancing cells and a suggestion of moving filaments amongst them. Töpfer observed short rods. Professor Riemer, who summarises these observations in the *Münch. med. Wochenschr.* for Jan. 16th, has now found spirochætes very scanty in direct films, but fairly abundant after anaerobic culture for a week in blood serum. He gives micro-photographs showing an organism scarcely longer than the diameter of a red blood cell, with four turns, exceedingly mobile and difficult to see unstained, but readily taking up any anilin dye and decolourising with Gram. Some of the spirochætes were longer, with a middle piece between the turns as though two spirals were intertwined. Attempts to infect guinea-pigs with the organism were unsuccessful, and Professor Riemer is too cautious to

assert that he has discovered the causal agent of the disease, although he believes that he has done so. The analogy with relapsing fever is evident. If his observations are confirmed, trench fever must be added to the rapidly growing list of spirochætal diseases. Dr. Galli Valerio, from the Lausanne Hygienic Institute, has recently enumerated them as syphilis (*S. pallida*), yaws (*S. pertenuis*), relapsing fever (*S. obermeieri* and others), Weil's disease (*S. icterohæmorrhagiæ*), bronchitis of Castellani (*S. bronchialis*), angina of Plaut-Vincent (*S. vincenti*), pyorrhœa alveolaris (*S. dentium* and others), and various spirochætes associated with local venereal ulcerations. In our present issue Dr. J. W. Scott Macfie gives an account of another spirochæte (*S. eurygyrata*), an apparently harmless inhabitant of the human intestine on the Gold Coast. On all counts spirochætosis is a subject of growing importance.

THE Hunterian lecture announced to be given before the Royal College of Surgeons of England by Captain Frank Cook, R.A.M.C., M.B., B.S., F.R.C.S., on Gunshot Wounds of Joints, their Pathology and Treatment, will be read in the theatre of the College to-day (Friday), at 5 o'clock P.M., by Professor Arthur Keith. The lecture will be illustrated by specimens from the War Office collection.

THE Morison lectures will be delivered by Dr. Edwin Bramwell, F.R.C.P. Edin. & Lond., before the Royal College of Physicians of Edinburgh, on Monday and Friday, March 5th and 9th, at 5 o'clock P.M. each day. The subject chosen by Dr. Bramwell is Neurology of the War; the first lecture will deal with Gunshot Wounds of the Peripheral Nerves, and the second with Shell Shock and the Effects of Head Injuries.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

A MEETING of the Executive Committee of this Fund was held on Feb. 22nd at THE LANCET Offices, when a printed statement was presented of the progress and working of the Fund during its first two years. The method of distribution of the statement was agreed upon by the Committee for, owing to the expense of paper, postage, and labour, it was not considered a fair demand on the resources of the Fund to send copies to all subscribers.

A communication was read from the London Branch of the International Relief Committee stating that it should be possible to continue to transmit the monthly grant of £800 to the Belgian medical organisation as now had been done for some time through Mr. Herbert Hoover, for in Mr. Hoover's absence the work of relief was still proceeding on the same lines.

The financial statement showed that the contributions since Dec. 15th, 1916, had amounted to £176, of which £147 had been received from the Royal College of Physicians of Edinburgh as a final contribution. £2400 had been sent to Belgium since the same date.

The Fund has received through Dr. William B. Coley and Dr. William K. Draper, acting as a committee of the New York Academy of Medicine, the sum of £132 12*s.* 5*d.*

SUBSCRIPTIONS.

	£	*s.*	*d.*
Doctors in the Belgian Congo (per M. Boulanger)—Dr. Marsez, 200 fr.; Dr. Etienne, 500 fr.; Dr. Heiberg, 500 fr.; Dr. Dubois, 50 fr.; Dr. Daniel, 100 fr.; Dr. De Lobelle, 500 fr.; M. Pessaniti (pharmacien), 100 fr.; M. Boulanger (pharmacien), 100 fr. = ...	80	0	0
Dr. G. D. H. Carpenter (eighteenth, nineteenth, twentieth, twenty-first, and twenty-second donations—total, £22) ...	5	0	0
Royal College of Physicians of Edinburgh (per Dr. Norman Walker)	147	2	11
Doctors of Invercargill, N.Z. (per Dr. Colquhoun)	21	0	2
Dr. F. de Havilland Hall (sixth donation—total, £12)	2	0	0
Mr. William Cook (per the *Chemist and Druggist*)	0	2	6
New York Academy of Medicine, $630 = ...	132	12	5

PHYSICAL TREATMENT FOR DISABLED SOLDIERS.

STATEMENT AND RECOMMENDATIONS BY THE COMMITTEE OF COUNCIL OF THE SECTION OF BALNEOLOGY AND CLIMATOLOGY OF THE ROYAL SOCIETY OF MEDICINE.

1. The serious and urgent problem of the physical treatment and training of disabled and discharged soldiers has been a long time under discussion, and it may be hoped is now approaching a solution. The committee, having devoted more than two years to an investigation of the subject in England and France, feel bound to reassert their profound conviction, already twice urged in reports to the War Office (August 28th, 1915, and Feb. 18th, 1916), that physical treatment, so often advocated by them, is now the thing most needed to prevent the formation of an army of cripples in this country. What has been already done here and there only points the way to the much larger aim of the committee, and that is to provide an adequate and well-ordered system of physical treatment for every disabled soldier throughout the country who needs it, as far as possible before his discharge. Such physical treatment consists of hydrotherapy, electrotherapy (including radiotherapy), mechanical treatment, medical gymnastics, and massage.

2. At the British spas large numbers of wounded have received treatment by waters and baths, although considerable difficulty and delay in obtaining this treatment is sometimes experienced. The number of invalids requiring such treatment is likely to increase, and the committee are of the opinion that the hospital accommodation for soldiers at the spas should be reserved for cases requiring hydrological treatment.

3. The committee are further of opinion that as the importance of systematic methods and records is becoming more and more apparent, the general adoption of one simple system of recording cases is most desirable, in order that the records supplied from all centres of physical treatment, whether at spas or attached to hospitals, may admit of exact classification

4. A clinic for the physical treatment of disabled officers was opened at 126, Great Portland-street, London, W., in July, 1916, as a result of the efforts of certain members of this committee. The intention of the promoters of this clinic was to provide an institution, thoroughly well equipped, which would afford to officers who were patients in the various hospitals in London the combination of the different forms of physical treatment which seemed necessary. Those responsible for it have endeavoured with some success not only to combine the best methods of treatment but to secure the accurate keeping of measurements and records. It is not a copy of any existing institution, and embodies some new features, such as the "whirlpool" and "sedative pool" baths. The clinic is now financed by the British Red Cross Society, and is called "The Red Cross Clinic for Physical Treatment of Disabled Officers." Officers of all the Allied nations are treated free of charge under careful and constant medical supervision. It is a matter of satisfaction to the committee that so much excellent work in physical treatment is now being done at certain of the command depôts, convalescent camps, military hospitals, and Red Cross hospitals. The experience already obtained clearly indicates the possibilities of such treatment when properly applied.

5. The vocational re-education of disabled soldiers in the British Islands, so far as it exists at present, has been in many instances carried out without medical supervision, and not associated with any concurrent physical treatment nor with any systematic measurement of the patient's disability and progress. The committee cannot regard this as satisfactory. On the other hand, they know that excellent re-educational work under medical supervision has been already accomplished at the Military Orthopædic Hospital at Shepherd's Bush and at certain of the command depôts.

The senior honorary secretary reports as the result of a visit just paid to certain centres for physical treatment and training in France, under both the French and Belgian Governments, that the arrangements for industrial, intellectual, and agricultural re-education are being continually extended in that country, and are in every case under medical direction. Essential importance is attached by French experts to the combination of re-education with physical treatment. The committee notice with much

interest that these facts have been set forth very clearly by Sir Henry Norman in his recent report to the War Office on the Treatment and Training of Disabled and Discharged Soldiers in France.

They would only add that, in their opinion also, physical treatment should in the great majority of cases be provided as an integral part of re-education; and that the determination of a man's capacity for work ought not to depend on casual observations, but on the results of the periodical measurement of his progress by means of accurate instruments. The very important economic and financial aspect of this matter are outside the province of the committee.

Recommendations.

1. That a service of physical treatment consisting of hydrotherapy, electrotherapy (including radiotherapy), mechanical treatment, medical gymnastics, and massage, should be made available at the earliest possible date for all soldiers needing it who are disabled by war.

2. That centres of physical treatment, comprising all the above methods, should be established throughout the country on an adequate scale, and wherever possible in association with general hospitals, so that other forms of special treatment and diagnosis may be readily available.

3. That at such centres there should be a uniform system of measurements and records.

4. That centres of re-education and centres of physical treatment should be closely associated.

5. That all centres of physical treatment should be under medical direction, with periodical inspection, and that medical men who are experts in the various departments of physical treatment should be appointed to the staff.

6 That at the centres first established instruction in methods of physical treatment should be provided for the use of medical practitioners, medical students, and assistants.

(Signed) WILLIAM GORDON,
President of the Section;
SEPTIMUS SUNDERLAND,
Chairman of the Committee;
R. FORTESCUE FOX,
J. CAMPBELL MCCLURE,
Feb. 24th, 1917. Hon. Secretaries of the Committee.

URBAN VITAL STATISTICS.

VITAL STATISTICS OF LONDON DURING JANUARY, 1917.

IN the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the ten diseases specified in the table was equal to an annual rate of 4·0 per 1000 of the population, estimated at 4,310,030 persons in the middle of the year; in the three preceding months the rates were 5·4, 5·0, and 3·9 per 1000 respectively. The lowest rates in January were recorded in Kensington, Hammersmith, Hampstead, Holborn, the City of London, and Wandsworth; and the highest rates in Paddington, Bethnal Green, Stepney, Poplar, Southwark, Bermondsey, and Greenwich. The prevalence of scarlet fever showed no variation from that recorded in the preceding month; this disease was proportionally most prevalent in Fulham, Chelsea St. Marylebone, Bethnal Green, Stepney, Bermondsey, Lewisham, and Woolwich. The Metropolitan Asylums Hospitals contained 800 scarlet fever patients at the end of the month, against 1117 1066, and 913 at the end of the three preceding months; the weekly admissions averaged 95, against 160, 131, and 95 in the three preceding months. Diphtheria was rather more prevalent than in the preceding month; the greatest proportional prevalence of this disease was recorded in Paddington, Stepney, Poplar, Southwark, Bermondsey, and Greenwich. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1543 and 1479 at the end of the two preceding months, had further declined to 1420 at the end of January; the weekly admissions averaged 168, against 209, 187, and 143 in the three preceding months. Enteric fever also showed a slightly increased prevalence; of the 36 cases notified during the month, 7 belonged to Stepney, 5 to Wandsworth, 4 to Hackney, 2 to Kensington, 2 to the City of Westminster, 2 to Battersea, 2 to Camberwell, and 2 to Deptford. There were 35 enteric fever patients under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 39, 42, and 37 at the end of the three preceding months; the weekly admissions averaged 6, against 7, 7, and 5 in the three preceding months. Erysipelas was proportionally most prevalent in Bethnal Green, Poplar, Southwark, Bermondsey, and Deptford. The 21 cases of puerperal fever notified during the month included 3 in Bethnal Green, 3 in Stepney, 2 in Fulham, 2 in Poplar, 2 in Lewisham, and 2 in Woolwich. The 70 cases of cerebro-spinal meningitis included 7 in St. Pancras, 6 in Islington, 5 in the City of Westminster, 5 in Lambeth, and 4 each in Paddington, Fulham, Hackney, Southwark, Wandsworth, and Woolwich; and of the 10 cases of poliomyelitis 2 belonged to Islington and 2 to Lambeth.

The mortality statistics in the table relate to the deaths of persons actually belonging to the several metropolitan boroughs, the deaths occurring in institutions having been distributed among the several boroughs in which the deceased persons had previously resided. During the five weeks ended Feb. 3rd the deaths of 7591 London residents were registered, equal to an annual rate of 18·4 per

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING JANUARY, 1917.

(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1915.	Notified Cases of Infectious Disease.												Deaths from Principal Infectious Diseases.									
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.	Deaths from all causes.	Death-rate per 1000 living.
LONDON	**4,310,030**	—	**517**	**777**	**1**	**36**	**4**	**21**	**203**	**70**	**10**	**1639**	**4·0**	—	**151**	**6**	**57**	**19**	**9**	**93**	**335**	**0·8**	**7591**	**18·4**
West Districts:																								
Paddington	131,397	—	13	32	—	—	—	1	10	4	—	60	4·8	—	—	—	2	1	1	4	8	0·6	278	22·1
Kensington	155,796	—	19	12	—	2	—	—	4	2	—	39	2·6	—	—	1	—	—	—	5	6	0·4	287	19·2
Hammersmith	118,559	—	10	17	—	1	—	—	2	2	1	33	2·9	—	—	—	1	—	1	1	3	0·3	206	18·1
Fulham	151,161	—	23	33	—	—	—	2	5	4	—	67	4·6	—	—	—	1	—	—	4	5	0·3	244	16·8
Chelsea	58,421	—	13	6	—	—	—	—	1	—	—	20	3·6	—	2	—	—	—	—	2	4	0·7	120	21·4
City of Westminster	135,104	—	11	14	—	2	—	—	7	5	—	39	3·0	—	3	—	2	1	—	1	7	0·5	249	19·2
North Districts:																								
St. Marylebone	100,260	—	16	10	—	1	—	1	5	1	1	35	3·6	—	4	—	1	—	1	—	6	0·6	189	19·7
Hampstead	81,760	—	6	13	—	1	—	—	3	—	—	23	2·9	—	—	—	—	—	—	2	2	0·3	118	15·1
St. Pancras	200,322	—	22	30	—	—	—	1	6	7	1	67	3·5	—	13	—	3	—	—	6	22	1·1	391	20·4
Islington	316,242	—	42	53	—	1	—	—	16	6	2	120	4·0	—	3	1	2	4	1	4	15	0·5	571	18·8
Stoke Newington	50,527	—	3	8	—	1	—	1	1	1	—	15	3·1	—	—	—	2	—	—	—	2	0·4	82	16·9
Hackney	217,883	—	22	35	—	4	—	—	8	4	—	73	3·5	—	—	—	2	1	2	6	11	0·5	346	16·6
Central Districts:																								
Holborn	40,405	—	3	—	—	—	—	—	2	2	—	7	1·8	—	3	—	—	—	—	—	3	0·8	97	25·0
Finsbury	76,915	—	7	14	—	—	—	1	5	—	—	27	3·7	—	—	—	1	2	—	1	4	0·5	170	23·1
City of London	19,461	—	1	4	—	—	—	—	—	—	—	5	2·7	—	—	—	1	—	—	—	1	0·5	27	14·5
East Districts:																								
Shoreditch	103,627	—	13	15	—	1	3	—	5	—	—	37	3·7	—	1	—	—	2	—	7	10	1·0	185	18·6
Bethnal Green	120,207	—	17	20	—	1	—	3	13	2	—	56	4·9	—	8	1	—	—	—	5	14	1·2	206	17·9
Stepney	265,731	—	44	72	1	7	—	3	14	3	—	144	5·7	—	10	2	8	—	—	5	25	1·0	458	18·0
Poplar	156,247	—	15	40	—	1	—	2	14	—	1	73	4·9	—	3	—	3	1	—	2	9	0·6	243	16·2
South Districts:																								
Southwark	179,424	—	12	64	—	—	—	1	16	4	1	98	5·7	—	19	—	2	—	—	8	29	1·7	375	21·8
Bermondsey	117,188	—	23	31	—	1	—	1	10	1	1	68	6·1	—	22	—	2	—	—	—	24	2·1	227	20·2
Lambeth	284,188	—	31	64	—	1	1	—	12	5	2	116	4·3	—	15	—	6	3	—	8	32	1·2	531	19·5
Battersea	161,945	—	21	21	—	2	—	—	2	2	—	48	3·1	—	4	—	1	1	1	3	10	0·6	285	18·4
Wandsworth	312,249	—	27	30	—	5	—	—	7	4	—	73	2·4	—	13	1	4	—	—	2	20	0·7	436	14·6
Camberwell	254,385	—	29	44	—	2	—	—	11	3	—	89	3·6	—	13	—	4	1	1	10	29	1·2	463	19·0
Deptford	110,299	—	11	25	—	2	—	—	9	1	—	48	4·5	—	1	—	3	—	—	3	7	0·7	198	18·7
Greenwich	96,385	—	11	28	—	—	—	—	5	—	—	44	4·8	—	5	—	3	1	—	1	10	1·1	171	18·5
Lewisham	164,438	—	32	23	—	—	—	2	3	3	—	63	4·0	—	1	—	2	—	1	—	4	0·3	244	15·5
Woolwich	129,505	—	20	19	—	—	—	2	7	4	—	52	4·2	—	8	—	1	1	—	3	13	1·0	194	15·6
Port of London	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

1000; in the three preceding months the rates had been 12·0, 14·5, and 22·6 per 1000. The death-rates during the month ranged from 14·5 in the City of London, 14·6 in Wandsworth, 15·1 in Hampstead, 15·5 in Lewisham, and 15·6 in Woolwich, to 21·4 in Chelsea, 21·8 in Southwark, 22·1 in Paddington, 23·1 in Finsbury, and 25·0 in Holborn. The 7591 deaths from all causes included 335 which were referred to the principal infectious diseases: of these, 151 resulted from measles, 6 from scarlet fever, 57 from diphtheria, 19 from whooping-cough, 9 from enteric fever, and 93 from diarrhœa and enteritis among children under two years of age. The lowest death-rates from these diseases in the aggregate were recorded in Hammersmith, Kensington, Fulham, Hampstead, Stoke Newington, and Lewisham; and the highest rates in St. Pancras, Bethnal Green, Southwark, Bermondsey, Lambeth, Camberwell, and Greenwich. The 151 deaths from measles were 15 in excess of the corrected average number in the corresponding period of the five preceding years; this disease was proportionally most fatal in St. Pancras, Holborn, Bethnal Green, Southwark, Bermondsey, Lambeth, and Woolwich. The 6 deaths from scarlet fever were 16 fewer than the corrected average number, and included 2 in Stepney and 1 each in Kensington, Islington, Bethnal Green, and Wandsworth. The 57 deaths from diphtheria were 9 below the corrected average; of these 8 belonged to Stepney, 6 to Lambeth, 4 to Wandsworth, 4 to Camberwell, 3 to St. Pancras, 3 to Poplar, 3 to Deptford, and 3 to Greenwich. The 19 fatal cases of whooping-cough were 70 below the corrected average, and included 4 in Islington, 3 in Lambeth, 2 in Finsbury, and 2 in Shoreditch. The 9 deaths from enteric fever were 7 below the corrected average, and included 2 in Hackney and 1 each in Paddington, Hammersmith, St. Marylebone, Islington, Battersea, Camberwell, and Lewisham. The 93 deaths from diarrhœa and enteritis among children under 2 years of age were only 4 below the average; the greatest proportional mortality from this cause was recorded in Paddington, Kensington, Chelsea, Shoreditch, Bethnal Green, Southwark, Lambeth, Camberwell, and Deptford. In conclusion, it may be stated that the aggregate mortality in London during the month from these principal infectious diseases was 21·4 per cent. below the average.

(Week ended Feb. 24th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18,000,000 persons, the annual rate of mortality was equal to 21·0, against rates steadily increasing from 16·2 to 22·5 per 1000 in the five preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 21·8, or 1·4 per 1000 less than that recorded in the previous week; in the remaining towns the rates ranged from 11·9 in Walthamstow, 12·2 in Edmonton, and 13·0 in Stockport, to 29·5 in Brighton, 30·3 in Bournemouth, and 34·7 in Gloucester. The principal epidemic diseases caused 336 deaths, which corresponded to an annual rate of 1·0 per 1000, and included 161 from measles, 65 from infantile diarrhœa, 52 from diphtheria, 50 from whooping-cough, and 4 each from scarlet fever and enteric fever. The deaths from measles showed a further increase on the numbers in the four preceding weeks, and caused the highest annual rates of 1·8 in Wimbledon and in Southampton, 2·1 in Dudley, 2·2 in East Ham, 2·6 in Ilford, and 4·2 in Wigan. The 813 cases of scarlet fever and the 1448 cases of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 7 and 11 in excess of the numbers at the end of the previous week. Of the 6974 deaths from all causes in the 96 towns, 245 resulted from violence. The causes of 83 of the total deaths were uncertified, of which 16 were registered in Birmingham, 11 in Liverpool, and 5 in Manchester, but only 1 in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death rate was equal to 19·6, against 17·9 and 20·1 per 1000 in the two preceding weeks. The 425 deaths in Glasgow corresponded to an annual rate of 19·9, against 21·8 per 1000 in London, and included 18 from whooping-cough, 16 from measles, 7 from diphtheria, 5 from infantile diarrhœa, and 1 each from enteric fever and scarlet fever. The 137 deaths in Edinburgh were equal to a rate of 21·5 per 1000, and included 3 from measles, 2 from whooping-cough, and 1 each from scarlet fever and diphtheria.

Irish Towns.—The 205 deaths registered in Dublin were equal to an annual rate of 26·8, or 0·4 per 1000 below that recorded in the previous week, and included 8 from infantile diarrhœa, 6 from measles, and 1 from whooping-cough. The 235 deaths in Belfast were equal to a death-rate of 31·2, and included 7 each from measles and infantile diarrhœa, 2 each from whooping-cough and diphtheria, and 1 from enteric fever.

THE LATE DR. JOSEPH LAWSON.—The death occurred at Hove on Feb. 18th of Dr. Joseph Lawson, who in the early days of his career was an assistant physician at Dr. Steevens' Hospital, Dublin. He was educated at Trinity College, taking the degrees of B.A., M.B. in 1868 and the L.R.C.S.I. in 1867. For many years he resided in Yorkshire, where he was medical officer of health at Hebden Bridge. Dr. Lawson, who was 70 years of age, had been living in retirement at Hove.

BRIGHTON AND THE INDIAN WARRIORS.—Official announcement was made at the meeting of the Brighton corporation on Feb. 22nd that the Indian Council had sanctioned an expenditure of £750 on the proposed monument to be erected on the South Downs at Patcham, where the bodies of Sikh and Hindu soldiers who died in the Indian hospitals at Brighton were buried, and towards the cost of maintaining it in perpetuity. The corporation had already voted a like sum (£750), and Mr. Austen Chamberlain, in his letter to Sir John Otter, ex-mayor, who took the initiative in the scheme, says that his council will not object to increasing its contribution to £1000 if the decisions taken as to design and material involve an outlay exceeding the £1500 already agreed upon.

THE SERVICES.

R.A.M.C. NEW HEADQUARTERS.

THE headquarters of the Army Medical Service will in future be at Adastral House, Victoria Embankment.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonels to be acting Colonels whilst employed as Assistant Directors of Medical Services of Divisions: R. W. Clements, D.S.O., H. Herrick, T. H. J. C. Goodwin, C.M.G., D.S.O.

Lieut.-Col. H. H. Brown is retained on the active list, under the provisions of Articles 120 and 522 Royal Warrant for Pay and Promotion, and to be Supernumerary.

Temp. Col. F. D. Bird, C.B., reverts to temporary Lieutenant-Colonel on re-posting.

Granted temporary rank whilst employed at the Craiglockhart War Hospital.—As Major: W. H. Bryce. As Captain: W. H. R. Rivers.

Temp. Major S. N. Davis, C.A.M.C., from General List, to be temporary Major.

Capt. H. C. D. Rankin to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Temp. Capt. J. S. Gladwin, C.A.M.C., from a Canadian Infantry Battalion, to be temporary Captain.

Temp. Capt. William James Dobson Smyth to be Lieutenant, and is granted the rank of temporary Captain.

Temporary Lieutenants to be temporary Captains: J. Potter, E. R. Dermer, J. J. O'Kelly, H. Stewart, S. L. Haslett, G. Sutherland, F. G. Heard, D. L. Sewell, W. E. Waller, J. R. Griffith, N. Grace, P. G. Temple, G. T. L. Murphy, D. M. Baillie, C. B. F. Tivy, H. V. Forster, J. Bamforth, E. E. Semmence, G. Hart, D. Smith, J. S. Part, D. J. Clark, G. G. Buchanan, F. M. Davies, J. L. Cochrane, R. C. Harkness, G. Jackson, E. W. N. Hobhouse, J. G. Slade, J. W. E. Cole, D. J. O'Brien, E. M. Balthasar, W. W. Halstead, G. E. Anderson, T. F. Moran, W. S. McGowan, J. P. Douglas, T. W. Ruttledge, P. G. Leeman, F. H. McCaughey, C. H. Seville, G. F. C. Healy, W. G. Jones, I. Williamson, C. H. C. Byrne, E. W. G. Young, J. S. Crawford, C. E. Sharp, P. Hudson, H. M. Buchler-Hayes, J. M. O'Reilly, H. McW. Daniel, A. P. Hart, A. N. W. Colahan, H. Stobie, R. Nichol, J. E. Cable, E. H. Wood, W. A. Muir, D. S. Steele-Perkins, G. C. Robinson, J. Colgan, A. G. East, W. J. Macdonald, C. S. Read, G. Cranstoun.

To be temporary Captains: S. Ritson, R. A. Jones, Temp. Lieuts. A. J. Anderson and W. Roche.

To be temporary Lieutenants: E. Ashby, K. J. A. Davis, L. V. Gatt, J. L. H. Paterson, M. C. Irwin, W. G. Cobb, A. P. Campbell, H. N. Webber, D. Mitchell, H. H. R. Bayley, G. W. Ancrum, J. Cameron, J. C. Pearce, M. J. Ryan, P. O. W. Browne, G. P. Jones, R. Maclean, D. S. E. Milligan, H. W. Catto, J. Freeman, J. Aylen, R. C. L. Batchelor, G. H. Joseph, C. J. G. Bouhill, D. Anderson, G. F. B. Simpson, J. E. Ratcliffe, D. C. Ogilvie, W. F. Box, A. R. H. Harrison, A. E. J. Douglas, M. S. Fraser, H. Cardin, temp. Hon. Lieut. N. S. Sherrard, M. Munro, Temp. Hon. Lieut. H. Archer, E. W. H. Cruickshank, W. P. Wippell, R. G. Stirling, J. R. Dick, T. T. M. Dishington, W. A. Clement.

Temporary honorary Lieutenants of the St. John Ambulance Brigade Hospital to be temporary honorary Captains: S. A. Henry, C. E. S. Jackson, W. Wilson.

Temp. Capt. J. G. Wilson, C.A.M.C., resigns his temporary commission at his own request.

Temporary Captains relinquishing their commissions: A. M. Ross, E. S. Moorhead, C. Banting, C. Gordon, W. A. Brown, J. E. Stacey (on account of ill-health caused by wounds, and is granted the honorary rank of Captain), H. J. Watt (on account of ill-health).

Temp. Hon. Capt. A. G. Wilkins and Temp. Hon. Lieut. P. L. Hope, having ceased to be employed with No. 5 British Red Cross (Anglo-American) Hospital, relinquish their commissions.

Temporary Lieutenants relinquishing their commissions: G. B. S. Soper, F. L. Spalding, H. Bond, C. G. Merrick, W. G. G. Coulter, J. P. Brown, J. S. Leslie, G. S. Robinson, W. E. Taylor, W. Dixon, T. M. R. Waddell, J. McIlraith.

SPECIAL RESERVE OF OFFICERS.

Lieutenants to be Captains: G. Chesney, A. R. Steven, W. A. Malone, J. Ross, J. C. Preston, A. Johnstone, G. S. Mather, A. F. Cook, A. C. Dickey, W. Griffiths, E. G. Fishe.

To be Lieutenants: G. A. Harrison, A. R. Dingley (from University of London Contingent, O.T.C.), A. T. Woolward, E. Parker (from Dublin University Contingent, O.T.C.), P. A. Buxton, D. C. Bluett.

TERRITORIAL FORCE.

Lieut.-Col. W. Patterson, Territorial Force Reserve, to be Major (temporary).

To be Acting Lieutenant-Colonels whilst commanding a Field Ambulance: Capts. (temp. Majors) E. A. Houchin, T. B. Layton, A. A. Hingston, P. Moxey, F. G. Dobson, and Capt. A. J. Williamson.

Capt. P. T. Rutherford, from Attached to Units other than Medical Units, to be Captain.

Lieutenants to be Captains: D. Cameron, J. Chalmers, E. McM. Dunlop, A. C. Hepburn, D. Campbell.

Capt. A. W. Falconer is seconded whilst holding a temporary commission in the R.A.M.C.

C. W. Yates to be Lieutenant.

Major (temp. Lieut.-Col.) A. E. Jerman relinquishes his temporary rank on ceasing to command a Field Ambulance.

Lieut. J. M. Orr resigns his commission.

A MEDICAL HIGH SHERIFF OF DUBLIN.—At a meeting of the Corporation of the city of Dublin last week, the High Sheriff of the city for 1917, Mr. Myles Keogh, L.R.C.S. Irel., was invested with the chain of office. It is many years since this dignity was held by a member of the medical profession. Mr. Keogh practises as a dentist.

Correspondence.

"Audi alteram partem."

THE MICTURITION CENTRE.

To the Editor of THE LANCET.

SIR,—In your issue of Feb. 3rd Mr. J. W. Thomson Walker, in an interesting account of the state of the bladder in man after injury to the spinal cord, makes some historical remarks on the micturition centre, which, I think, call for comment. He says—

The work of Gaskell shows that the centre for micturition lies outside the spinal cord, in the hypogastric and mesenteric plexuses of the sympathetic. Müller, applying Gaskell's view, states that after complete separation of the bladder from the cord reflex micturition still takes place.

Gaskell, I am sure, would have energetically rejected the statement that there was no micturition centre in the spinal cord. So far as I know no one who has experimented on the matter in the last 30 years has questioned its existence, although different values have been attributed to it. The existence of an additional centre outside the spinal cord has long been the subject of controversy. Sokownin[1] in 1874 found that stimulation of the central end of one hypogastric nerve, after severance of all connexion with the spinal cord, caused reflex contraction of the bladder, and considered it to be a reflex like that from the spinal cord involving afferent nerve cells. The experiment was taken as supporting the current theory that peripheral ganglia connected with organs acted as reflex centres for them. It was shown by Anderson and myself[2] in 1894, and by myself[3] in 1900, that the reflex did not involve afferent nerve fibres or cells, but was due to the branching of efferent fibres, one branch running to a nerve cell supplying one side of the bladder and the other to a nerve cell supplying the other side. This I spoke of as an axon-reflex. Goltz and Ewald[4] in 1896 found that micturition returned in dogs after removal of the whole spinal cord below the upper thoracic region. Müller[5] in 1901 made experiments similar to those of Goltz and Ewald, but with less extensive removal of the spinal cord, and confirmed their results. Gaskell,[6] in his book posthumously published in 1916, does not (so far as I have seen) make any mention of a micturition centre; he had not at any time made experiments with regard to it. He discusses the origin of peripheral reflexes in the bladder and elsewhere, and adopts the theory that, so far as they occur, they are due to axon-reflexes.

I am, Sir, yours faithfully,

Cambridge, Feb. 21st, 1917. J. N. LANGLEY.

ACUTE GASTRIC ULCER.

To the Editor of THE LANCET.

SIR,—Between Jan. 5th and Feb. 3rd of this year six cases of acute gastric ulcer (with pronounced hæmatemesis or melæna, or both hæmatemesis and melæna) were admitted to the Connaught Hospital, Aldershot. Only two cases of a similar nature have been admitted during the previous 22 months. Six cases will, of course, prove nothing, and their occurrence at short intervals may well be within the limits of ordinary coincidence; but the contrast between this comparatively large number and previous admissions of the same disease encourages me to speculate whether something more than coincidence might be invoked and to mention publicly the series for what it is worth as an isolated observation, in the hope that others may have noted the same "coincidence" at this or any other time. As a determining factor, mentioned merely on account of its obviousness, I suggest the protracted low temperature experienced over the whole of this period. I need not waste your valuable space with clinical details except to mention that the ages of the men were 29, 32, 34, 37, 38, and 40 respectively; their length of service varied from 10 days to 20 months; one case may have been of traumatic origin, none of the cases gave a history of previous hæmatemesis.

Finally, of the two previous cases referred to above, one was aged 35, the other 51. The elder, after repeated hæmatemesis, died, having existed upon salines for five weeks, during which time operation, which was urgently advised, was persistently refused.

I am, Sir, yours faithfully,

ADOLPHE ABRAHAMS,
Temporary Captain, R.A.M.C.; Officer in Charge Medical Division, Connaught Hospital, Aldershot.

Feb. 6th, 1917.

THE REPORT ON CEREBRO-SPINAL FEVER.

To the Editor of THE LANCET.

SIR,—New results of value to bacteriology, gleaned from recent research on identification of meningococci, are recorded in the Third Special Report[1] of the Medical Research Committee, and the general value of this document is enhanced by inclusion of other matters both of clinical and controversial interest. That at the onset of cerebro-spinal fever the same type of organism is always present in the naso-pharynx as is to be found in the spinal fluid is a fact of great value in early diagnosis, and Captain Flack[2] has shown that by plating a naso-pharyngeal swab on the spot it is possible to diagnose atypical cases within 48 hours.

Of less value seems the pronouncement[3] that naso-pharyngeal organisms, giving cultural and fermentative signs of meningococci, are to be rejected as *pseudo*-meningococci unless they conform to the serological reactions of one or other of four types of meningococci, isolated from 32 cases in 1915. Admitted that these types have predominated in epidemics during 1915-16, they do not exhaust the possible number of pathogenic strains. Flexner has isolated at least 32 strains. Two strains isolated by me[4] from spinal fluid were not agglutinated by antiserums from Gordon's Types 1, 2, or 3, but were agglutinated by Flexner in high dilutions, and it is surely an accepted principle of medicine that any germ may become pathogenic if tissue resistance be sufficiently lowered. If so, inagglutinable strains should be regarded as potentially pathogenic. My objection to this limitation is its possible influence on treatment. Without access to a laboratory, where the organism might be differentiated into its serological type and if atypical a serum prepared—a matter of time and distance to country practitioners—it is certainly prejudicial to the patient to surmise that the organism must conform to one of four types, or to employ a serum evolved from one of them. The indication is rather to use a multivalent serum, such as Flexner's. Fleet-Surgeon Bassett-Smith[5] found that of 28 naso-pharyngeal strains 27 were agglutinated by Flexner. Of these, 21 were also tested with Gordon's serums 1 and 2. Seven agglutinated to 1 and 13 to 2.

Lastly, this report contains such authoritative confirmation of the theory of cerebro-spinal fever[6] advanced by me in 1915, that I cannot but regret an absence of any endorsement of those preventive measures which should follow the correct etiology. Lieutenant-Colonel M. H. Gordon and Captain Flack[7] accept spread of infection as due to floating droplets of infected naso-pharyngeal secretion from the "carrier," and as influenced by "the degree of bad ventilation or overcrowding obtaining in his immediate environment." Again, Captain Flack[8] confirms my earlier observation, embodied in a report to the War Office on Sept. 27th, 1915, that swabs and plates conveyed some distance on a cold day to a laboratory are liable to be negative. The point is that meningococci die in 30 minutes at a temperature of 62° F.

I have contended that under conditions of fresh air it is impossible for meningococci to pass from throat to throat, and Captain Flack records a new observation on this point—"whatever the form of treatment, a spell of sunshine and dry weather markedly influenced the rate of discharge of carriers."[9] This suggests that fresh air not only prevents

[1] Fourth Vers. russischer Naturforscher in Kasan (Summary in Arch. f. d. ges. Physiol., x., 374).
[2] Journ. of Physiol., xvi., 410.
[3] Ibid., xxv., 364.
[4] Arch. f. d. ges. Physiol., lxiii., 362.
[5] Deutsch. Zeitschr. f. Nervenheilk., xxi., 86.
[6] The Involuntary Nervous System (Longmans, Green, and Co.).

[1] National Health Insurance. Special Report Series. No. 3. Bacteriological Studies in the Pathology and Preventive Control of Cerebro-spinal Fever among the Forces during 1915 and 1916.
[2] Loc. cit., p. 19 [3] Ibid., p. 14.
[4] THE LANCET, 1915, ii., 862. [5] Loc. cit., p. 68.
[6] THE LANCET, 1916, ii., 828.
[7] Loc. cit., p. 77. [8] Ibid., p. 62. [9] Ibid., p. 63.

spread of infection, but also tends to destroy organisms in the throat. Nevertheless, in the report there is no plea for better ventilation of tents, huts, and barracks, although much labour has been expended on construction of steam engines for belching forth antiseptic vapours. To what end? That "carriers," once disinfected, shall return from the clouded atmosphere of the sterile shrine to those unhygienic conditions under which infection arose and was spread?

In all this there is nothing to occasion surprise. For seven centuries bad air was recognised in the etiology of tuberculosis, while fresh air was ignored in prevention. History will always repeat itself, and so to-day nothing short of a miracle will induce our profession to act on the true origin and prevention of cerebro-spinal fever. Yet in conclusion I would suggest that the tendency of special departments of medicine to attenuate wider physiological and clinical concepts into a microscopic field is to be regretted. I am, Sir, yours faithfully,

HALLIDAY SUTHERLAND,
Harley-st., W., Jan. 20th, 1917. Temporary Surgeon, Royal Navy.

THE USE OF QUININE INTERNALLY AS AN ANTISEPTIC.

To the Editor of THE LANCET.

SIR,—Eight years ago when called in by a midwife to a case of puerperal septicæmia, after curetting and douching the uterine cavity, I ordered daily douching with weak iodine lotion and internally quinine sulphate 2 gr. combined with acid. hydrobromic. dil. every four hours in water. As the temperature rapidly fell to normal and the discharge became sweet and small in amount I continued its use in such cases with gratifying success and commenced to put all cases of perityphlitic abscess, gall-bladder abscess, and empyema upon it immediately after operation. In cases of infective bone and joint disease, such as periostitis, osteomyelitis, and suppurative arthritis, I ordered quinine immediately upon admission and prior to operation, continuing it afterwards as in the previous cases. As a result I found that the discharge rapidly diminished in amount, becoming thin, inoffensive, and less purulent, the temperature usually becoming normal in a few days, when the quinine can be discontinued. When the quinine was discontinued before the temperature had been normal for several days the discharge was apt to increase in quantity, becoming more purulent and offensive, with a rising temperature. In discharging bone and joint cases in which quinine was administered before operation, the temperature fell to a lower level and the discharge diminished more rapidly than in other cases. During the eight years my annual operative mortality has not exceeded 2 per cent., rarely more than 1 per cent., in general surgical hospital work.

Acting on this experience I have employed quinine in all cases of septic infection since July, 1915, at the Hotel Dieu, Waterloo and District Hospital, the annexe of the Seaforth Military Hospital, where I have had control of 50 beds. A large number of cases of infected gunshot wounds, many of which contained necrosed bone, have been treated there under my care. The mortality rate of my surgical operative military cases has been *nil* during that period on a total of more than 130 cases.

Dr. J. Mitchell Bruce in his "Materia Medica and Therapeutics," 1915 edition, makes the following, among other, statements regarding the action of quinine: (1) Externally quinine is a local antiseptic, and disinfectant to wounds and ulcers; (2) it may be found in the blood within a few minutes of its administration; (3) it diminishes the number of leucocytes in the circulation very greatly; (4) it augments and later paralyses the amœboid movements of leucocytes; (5) injected into animals in large dose it prevents the occurrence of suppuration. The action appears to me as follows: Quinine internally administered rapidly renders the blood-stream antiseptic, thus retarding the rate of increase, growth, and development of micro-organisms in all parts of the body. The body cells which are manufacturing antitoxin in response to the toxic stimulation are thus enabled to get the upper hand, and are probably aided by the phagocytes.

I am indebted to Professor E. E. Glynn, of Liverpool University, for two references, the only ones which I can find, on the value of quinine proved experimentally. (1) Wilson,[1] who concludes that "The administration of 15 grains of quinine to healthy students seemed to cause a slight increase in their opsonic index," and that "quinine sulphate *in vitro* has an inhibitory effect on phagocytosis in strong solutions, but apparently a stimulating influence in dilutions from 1/15,000 to 1/1,000,000"; and (2) Th. Grün-pan,[2] "Ueber den Einfluss von Chininlösungen auf die Phagocytose," who states that a 0·002 per cent. quinine solution led to a relative increase in phagocytosis of a carmine solution in a rat, but a 0·1 per cent. of quinine solution was injurious to phagocytosis.—I am, Sir, yours faithfully,

VINCENT J. GLOVER, M.D. Liverp., M.B., Ch.B. Vict.,
Medical Officer of Health, Waterloo and Seaforth; Honorary
Feb. 15th, 1917. Surgeon, Waterloo and District Hospital.

LIQUOR RESTRICTION AND CASUALTIES.

To the Editor of THE LANCET.

SIR,—It is interesting to note how drunkenness amongst working classes affects the hospital casualty rooms. This is the main casualty hospital in the borough of Bootle and round about, draining from a large "labour" population. The casualty room is open day and night, and I, having the unfortunate honour of being in charge, especially on Saturdays, have noticed how often I had to attend to these "merry-making accidents." Before the present regulations I would not dream of retiring to bed before 1 or 2 A.M., as the casualty room was very frequently visited by customers of public-houses or those who suffered through them. Lately, gratifying to see, it is seldom that we come across a person in such a state. The usual question of a constable, "Is it delirium tremens, doctor?" to detain him over the week-end, is almost forgotten.

Without exaggeration I can safely say that *these* casualties are reduced to 40 per cent., if not less, whereas other "unavoidable" cases remain the same. I have not had a case of intoxication as a cause of other injuries in the wards for a long time. Further, this hospital, being situated in the midst of a thickly populated area, we used to be troubled at night with "music, mirth, and revelry" outside, but audible in every ward; this no longer exists. I am writing to know, as expected, if other house surgeons thus placed have noticed the same incidence, for surely it could not be the Bootle people only who have so suddenly and marvellously changed into temperance.

I am, Sir, yours faithfully,

D. RAM THAPAR, M.B., Ch.B. Edin.
Borough Hospital, Bootle, Feb. 26th, 1917.

THE FIRST SCHOOL FOR MOTHERS.

To the Editor of THE LANCET.

SIR,—If only for the sake of historical accuracy, may I be permitted to point out that your correspondent, Dr. J. E. Sandilands, in his letter in your issue of Feb. 17th, is as incorrect in his facts as to which was the first school for mothers in England as was the writer of the article whose statements he criticises. As a matter of fact, Winchester has no better claim to have started the first school for mothers than St. Pancras. Although opinions may differ as to the exact definition of a school for mothers, there can be no doubt that the special kind of infant welfare work started in Winchester in November, 1906, had been in progress in at least a dozen other towns for some considerable number of years before that date. If Dr. Sandilands would care for details, I can give them to him, but I think he will find sufficient evidence on this point in a paper I read at the National Conference on Infant Mortality held in Liverpool, 1914, and published in the report. No society or institution can claim to be a school for mothers without an infant consultation, for this is the pivot round which all its teaching activities revolve. The first welfare centre to have an infant consultation was that of St. Marylebone. Its schools of mothercraft were started in February, 1906, under the name of the Borough of St. Marylebone Health Society, and its Infant Consultation opened its doors on May 10th, 1906.

The opening of the St. Pancras School for Mothers was inaugurated on July 1st, 1907, at the St. Pancras Town

[1] Amer. Journ. Physiol., 1907, xix., 450.
[2] Centralbl. f. Bakt. und Parasit. Infekt., 1908, Bd. xlviii., 445.

Hall. I have in my possession the printed bill inviting the attendance of the public, so that there can be no doubt as to the date; but, as a matter of fact, St. Pancras was not, I believe, even the second in the list of schools for mothers. Although the St. Pancras school is in no way entitled to the claim of being the pioneer school, there is no question that in propaganda work this London borough deserves the greatest credit. But Winchester has no claim either to have been the first school for mothers or a pioneer in instructing mothers.

I am, Sir, yours faithfully,

London, W., Feb. 25th, 1917. ERIC PRITCHARD.

THE DIFFERENTIATION OF HEART MURMURS IN SOLDIERS.

To the Editor of THE LANCET.

SIR,—I beg to offer a few remarks on this subject before it passes from review, as I have had it under observation for several years and am, perhaps, in a position to throw some further light on it. I gave a brief account of the murmurs in question in 1913,[1] and a somewhat fuller one under the title of the "Soldier's Heart" last year.[2] In the latter I pointed out that "in many cases the murmurs subside under firm pressure of the chest-piece of the stethoscope against the thoracic wall and return under a lighter touch," and suggested that the apparent vigour of the heart's action and increase in the force of the apex beat, together with diffusion of its area, are due to deficiency or absence of the normally intervening cushion of lung, while firm pressure on the ribs, inhibiting the megaphonic effect of vibration, at once reduces the sounds to their actual value, which is characteristic of deficiency rather than increase of energy, such as obtains in hypertrophy. I have observed the occurrence of the same phenomenon during accesses of paroxysmal tachycardia and its subsidence as soon as the action of the heart returns to its normal frequency. As far as I am aware, it has not as yet been recorded that similar acoustic results may in like manner be elicited in simple dilatation of the aorta, whether due to atony or inflammation, and will assist in differentiating that condition from the early stage of aneurysm.

Up to the time of the war my observations were mainly made on public school boys, and in a less degree on the more mature subjects to be found among undergraduates, who had sustained dilatation of special incidence on the right heart as the result of long-distance running or boat-racing. Subjects whose cardiac and arterial walls have been weakened by toxæmia, mostly of alimentary origin, are specially prone to develop such murmurs. As Professor Drummond insists they are quite distinct from those due to dilatation of the orificial rings and from cardio-respiratory bruits. His observation that in some cases they are audible only when the patient is lying on his left side is new to me, but it seems to support the explanation which I have offered. In any case, their inconstancy and variability stamp them, in common with all murmurs dependent on or largely influenced by posture, as not being of organic origin.

I am, Sir, yours faithfully,

Harley-street, W., Feb. 19th, 1917. W. BEZLY THORNE.

[1] Proceedings of Royal Society of Medicine, 1913, vi., 93-97.
[2] Practitioner, May, 1916.

HARVEIAN SOCIETY OF LONDON.—Mr. J. Ernest Lane will deliver the Harveian lecture on the Treatment of Syphilis at the Stafford Rooms, Tichborne-street, Edgware-road, W., on Thursday, March 22nd, at 8.30 P.M.

Mrs. Tubby, the wife of Colonel A. H. Tubby, F.R.C.S., consulting surgeon with the Forces, has received the bronze medal and certificate of the Royal Humane Society for the gallant rescue from drowning of two Egyptian ladies.

NATIONAL COUNCIL FOR COMBATING VENEREAL DISEASES.—At a meeting held at 1, Wimpole-street on Monday last it was decided to establish a London and Home Counties Branch of the National Council. Lord Sydenham, who presided, stated that the branch was to be entirely independent of the National Council, which would assist it in every possible way, retaining the censorship of all literature issued. An executive committee of 30 was appointed representing the various medical, social, and administrative bodies concerned.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Lieut. C. Stiebel, I.M.S., was educated at Clifton and at Cambridge, and was a student at St. Thomas's Hospital, London, qualifying in 1902. He had held appointments at the West London Hospital, at Bradford Infirmary, and at St. Marylebone Infirmary, afterwards proceeding to India to work as a medical missionary, and later joined the Indian Medical Service. On the outbreak of war he went to Alexandria and afterwards to the Dardanelles and to Mesopotamia.

Capt. J. E. Milne, D.S.O., R.A.M.C., was educated at Aberdeen University, and qualified in 1891. He joined the R.A.M.C. in October, 1915, and was awarded the D.S.O. for gallantry on the Somme. Prior to joining the Army he had a large practice in Aberdeen.

Capt. J. A. Harper, R.A.M.C., attached Yorkshire Regiment.

Died of Wounds.

Capt. E. W. S. Martin, R.A.M.C., attached Worcester Regiment, was educated at Queen's College, Belfast, and qualified in 1899. He was in practice in the Rhymney Valley of Monmouthshire, where he held several public appointments, prior to the outbreak of war, and after joining up he went to Malta and afterwards to Mesopotamia.

Capt. J. R. Macallan, R.A.M.C., attached East Lancashire Regiment, qualified in 1910 at Glasgow.

Wounded.

Capt. F. E. Chapman, R.A.M.C.
Capt. C. O'Brien, R.A.M.C.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Second Lieut. G. S. Cooper, Northamptonshire Regiment, only son of Dr. H. S. Cooper, of Yaxley, Peterborough.

Capt. J. B. B. Ford, Royal West Kent Regiment, only child of Surgeon-General Sir R. W. Ford, D.S.O.

Lieut. F. E. S. Townsend, Durham Light Infantry, eldest son of Dr. F. E. Townsend, of Normanby, Yorks.

Lieut. A. E. Townsend, Durham Light Infantry and Royal Flying Corps, second and last surviving son of Dr. F. E. Townsend, of Normanby, Yorks.

Capt. N. West, M.C., Bedford Regiment, second son of Capt. C. J. West, R.A.M.C., of Newbury, Berks.

MENTIONED FOR WAR SERVICES.

The Secretary of State for War has issued a long list of names which have been brought to his notice for valuable services rendered in connexion with the war, and the names of the following medical officers are included:—

Army Medical Service.

Adams, Col. G. G.; Beamish, Col. J. M.; Bedford, Surg.-Gen. W. G. A., C.B., C.M.G.; Birch, Col. de B., C.B., V.D.; Birrell, Surg.-Gen. W. G.; Bond, Hon. Col. C. J.; Bull, Col. W. H., V.D.; Burnside, Col. E. A.; Butt, Col. E.; Coates, Col. W., C.B.; Croly, Col. A. E. J.; Culling, Surg.-Gen. J. C.; Dewar, Col. T. F.; Faunce, Col. C. E.; Forman, Col. R. H.; Giles, Col. P. B., C.B.; Gore, Col. St. J. C., C.B.; Griffiths, Col. J.; Hathaway, Surg.-Gen. H. G., C.B.; Hind, Bt.-Col. W.; Hoyland, Col. S. S.; Jencken, Surg.-Gen. F. J.; Jennings, Col. R.; Kinnear, Col. W.; Lucas, Col. T. J. R., C.B.; May, Col. W. A., C.B.; Oliver, Col. C. P.; Peterkin, Col. A., ret. pay; Raywood, Col. J. R. I.; Russell, Col. A. F., C.M.G., ret. pay; Rutherford, Col. J. V. W., V.D., T.F. Res.; Todd, Col. O.

Royal Army Medical Corps.

Abrahams, Temp. Capt. A.; Anderson, Maj. J. A.; Anderson, Lt.-Col. J. B.; Anderson, Maj. R. Y.; Annis, Capt. E. G.; Averill, Lt.-Col. C.

Bartholomew, Maj. E. U.; Battersby, Lt. Col. J., ret. pay, late R.A.M.C.; Baxter, Capt. A.; Bennett, Capt. J. A.; Biggs, Maj. G.; Bolam, Lt.-Col. R. A.; Bond, Lt.-Col. R. P.; Bostock, Bt. Lt.-Col. J. S.; Bramhall, Maj. C.; Broderick, Capt. F. W.; Brown, Lt.-Col. H. H.; Buchanan, Lt.-Col. J. B. W., ret., late R.A.M.C.; Buchanan, Temp. Capt. R.; Burgess, Lt.-Col. (temp. Col.) P. C.; Bush, Lt.-Col. J. P., C.M.G.

Caldwell, Lt.-Col. R.; Callam, Lt.-Col. A.; Callender, Lt.-Col. E. M.; Carter, Temp. Maj. A. H.; Carter, Temp. Maj. (Lt.-Col. T.F. Res.) T. M.; Causton, Temp. Capt. E. P. G.; Chambers, Maj. A. J., ret.; Charlesworth, Lt.-Col. H., C.M.G., ret.; Childe, Lt.-Col. C. P.;

Connel, Lt.-Col. A.; Corkery, Lt.-Col. M. P.; Cosens, Capt. W. B.; Coward, Temp. Maj. E. G.; Cox, Maj. J. J.; Crooke-Lawless, Surg. Lt.-Col. W. R., late C. Gds., attd. R.A.M.C.

Daly, Temp. Capt. C. C. de B.; Davies, Temp. Capt. F. J. P.; Dodd, Lt.-Col. A.; Drew, Capt. C. M.; Duggan, Maj. C. W.

Eames, Capt. (temp. Lt.-Col.) C. W.; Ellis, Temp. Lt.-Col. F. W.; Evans, Lt.-Col. D. E.; Ewing, Temp. Capt. J.

Fairchnie, Lt.-Col. N.; Falkner, Maj. M. W.; Farquharson, Capt. (temp. Maj.) A. C.; Fenwick, Lt.-Col. E. H.; Ferness, Maj. J. C.; Fleming, Temp. Maj. S.; Ford, Surg.-Gen. R. W., C.B., D.S.O.; Fothergill, Temp. Capt. E. R.; Fowler, Maj. C. E. P.; Franklin, Lt.-Col. D. F., ret. pay, late R.A.M.C.; Fuhr, Lt.-Col. R. S. R., D.S.O.

Gabriel, Maj. W. M.; Gemmel, Lt.-Col. A. B.; Gibbon, Temp. Lt.-Col. T. H.; Gillies, Temp. Capt. H. D.; Gillespie, Temp. Maj. D.; Gipps, Temp. Maj. A. G. P.; Gowans, Lt.-Col. T.; Grey, Maj. E.

Haig, Lt.-Col. P. B.; Hall, Lt.-Col. R. H.; Hall-Edwards, Temp. Maj. J.; Hamilton, Lt.-Col. T. W. O'H., C.M.G.; Harrison, Lt.-Col. L. K.; Haslam, Lt.-Col. W. F.; Hawkins, Lt.-Col. H. P.; Haydon, Lt.-Col. T. H.; Henry, Maj. R. W. W.; Hernaman-Johnson, Temp. Capt. F.; Holmes, Capt. W. M.

Jamieson, Maj. J. K.

Kay, Lt.-Col. A. G., ret. pay, late R.A.M.C.; Kaye, Lt.-Col. J. R.; Kearney, Lt.-Col. J., ret. pay, late R.A.M.C.

Lamtalle, Maj. F. W.; Lambert, Lt.-Col. F. S.; Leebody, Maj. H. A.; Le Quesne, Lt.-Col. F. S., V.C.; Lister, Capt. (temp. Lt.-Col.) W.; Littlewood, Lt.-Col. H.

McGillivray, Capt. A.; McGrigor, Capt H. J., Reserve of Officers; McLeish, Temp. Capt. D. J.; MacMillan, Temp. Capt. J. M.; Maconachie, Lt.-Col. J., ret. pay, late R.A.M.C.; Magrath, Lt.-Col. C. W. S.; Manning, Temp. Maj. N. S; Mant, Temp. Capt. H. T.; Marsh, Lt.-Col. F.; Marshall, Temp. Lt.-Col. W. L. W.; Maurice, Lt.-Col. W. J.; Maynard, Lt.-Col. E. F.; Miles, Temp. Lt.-Col. G. E.; Miller, Temp. Hon. Maj. C. H.; Moir, Maj. J. D., Res. of Off.; Moore, Lt.-Col. R. R. H.; Morris, Lt.-Col. A. B.; Morris, Temp. Lt.-Col. R. J.; Morse, Lt.-Col. R. B. R., ret. list; Mort. Temp. Lt.-Col. S.; Muir, Temp. Capt. G.; Murphy, Lt.-Col. Sir S. F.; Myddelton-Gavey, Maj. E. H.; Myles, Maj. E. H., ret. pay, late R.A.M.C.

Nichols, Lt.-Col. F. P.; Nicholson, Lt.-Col. J. E., ret. pay, late R.A.M.C.

O'Connell, Lt.-Col. M. D., ret.; Oldfield, Lt.-Col. J.; O'Reilly, Maj. P. S.; Orton, Lt.-Col. D. C. L.

Paton, Temp. Capt. R. R. K.; Patterson, Maj. D. W.; Pechell, Capt. H. J.; Pilcher, Lt.-Col. and Bt. Col. E. M., D.S.O.; Pirie, Maj. J. H. H.; Probyn, Lt.-Col. P. J., D.S.O.

Ranking, Lt.-Col. G. S. A., late I.M.S.; Roberts, Temp. Maj. H. J.; Roocroft, Lt.-Col. (Hon. Surg.-Col., temp. Col.) W. M.; Ruthven, Capt. M. W., Spec. Res.

Salvage Lt.-Col. J. V., ret. pay; Sedgwick, Temp. Capt. H. R.; Shirley, Temp. Maj. H. J.; Siberry, Maj. E. W.; Simpson, Col. R. J. S.; Sinclair, Maj. W. V.; Spencer, Temp. Maj. G. H.; Steele, Lt.-Col. W. H., ret. pay; Stewart, Temp. Capt. J. S.; Stott, Maj. H.; Swabey, Lt.-Col. L. W.

Tatham, Lt.-Col. C. J. W. (ret.); Taylor, Temp. Capt. J.; Thiele, Lt.-Col. C. W., ret. pay; Tidbury, Lt.-Col. J.; Tooth, Temp. Col. H. H.; Trower, Temp. Capt. A.; Turle, Capt. J. E.; Turner, Lt.-Col. W., ret. pay.

Vincent, Temp. Lt.-Col. W. J. N.

Wakeling, Temp. Capt. T. G.; Wallace, Maj. D., C.M.G.; Watson, Maj. G. W.; Webber, Lt.-Col. H. W.; Weekes, Temp. Capt. H. H.; White, Lt.-Col. S.; Whitestone, Lt.-Col. C. W. H.; Whitty, Lt.-Col. M. J., ret. pay; Williamson, Temp. Capt. J. R.; Wilson, Maj. A.; Wilson, Lt.-Col. G., ret. pay; Winter, Lt.-Col. T. B.; Wirgman, Capt. C. W.; Wishart, Temp. Capt. W. H.; Wolstenholme, Capt. (temp. Maj.) T. B.; Woodhead, Lt.-Col. G. S.; Woods, Temp. Capt. L. D.; Woodwark, Temp. Lt.-Col. A. S.; Woodyatt, Temp. Lt.-Col. J. F.; Wrangham, Temp. Lt.-Col. W. M. D.

Indian Medical Service.—Barry, Lt.-Col. T. D. C.; Collie, Lt.-Col. M. A. T., ret. pay; Crawford, Lt.-Col. D. G., ret. pay; King, Col. W. G.; Lewtas, Lt.-Col. J., ret. pay; Quayle, Col. W. A., ret.; Ricketts, Lt.-Col. W. S. P., ret.; Smith, Lt.-Col. J. C., ret. pay; Thompson, Lt.-Col. H., ret. pay.

South African Medical Corps.—McGrigor, Lt.-Col.; Murcell, Lt.-Col.; Pearson, Maj. M. G.; Robertson, Capt. G. W. S.; St. Leger, Maj. A. T.; Thornton, Lt.-Col. E. N.

Australian Infantry Force.—Fetherston, Col. (temp. Surg.-Gen.) R. H. J.

Canadian Army Medical Corps.—Allen, Capt. M. H.; Bagnall, Capt. A. W.; Baragar, Capt. C. A.; Bayley, Capt. B. M.; Bell, Maj. F. C.; Bouthellier, Capt. G.; Bowie, Maj. R.; Bowman, Capt. F. B.; Bridges, Col. J. W.; Brousseau, Lt.-Col. J. D.; Buell, Lt.-Col. W. S.; Cameron, Lt.-Col. I. H.; Chambers, Lt.-Col. G.; Clarke, Maj. D. A.; Courtenay, Lt.-Col. J. D.; Doherty, Maj. C. E.; Drum, Col. L.; Finley, Lt.-Col. F. G.; Goodall, Capt. J. R.; Hale, Capt. G. C.; Irving, Maj. L. B. W., D.S.O.; Lomas, Capt. A. J.; McGaffin, Capt. D. W.; MacKenzie, Capt. W. J.; McPherson, Maj. A. W.; McPherson, Lt.-Col. D. W.; Meakins, Maj. J. C.; Mersereau, Capt. H. C.; Mewburn, Lt.-Col. F. H.; Neff, Capt. E. A.; Orr, Capt. H.; Paul, Capt. H. E; Reason, Maj. C. H.; Rennie, Col. G. S.; Russell, Maj. C. K.; Scott, Col. W. A.; Smith, Maj. S. A., D.S.O.; Starkey, Maj. T. A.; Stevenson, Lt. G. J.; Thomas, Capt. R. W.; Warner, Capt. E. L.; Watt, Lt.-Col. W. L.; Williamson, Capt. H. J.; Wilson, Maj. R.; Young, Maj. C. A.

Ceylon Volunteer Medical Corps.—Rockwood, Major D.

Hong Kong Volunteer Corps.—Black, Surg.-Maj. G. D. R.

Royal Malta Artillery.—Mifsud, Surg.-Maj. A. E.; Randon, Surg.-Maj. R.

King's Own Malta Regiment of Militia.—Samut, Surg.-Maj. R.

British Red Cross and Order of St. John.—Samut, Lt.-Col. R. P.

New Zealand Medical Corps.—Barnett, Maj. (temp. Lt. Col.) L. E.; McKibbin, Capt. T.; Mill, Maj. (temp. Lt.-Col.) T.; Myers, Lt.-Col. B.; Parkes, Col. W. H., C.M.G.; Short, Capt. H.; Wylie, Maj. (temp. Lt.-Col.) D. S.

Miscellaneous Services.—Aikmen, Surg.-Col. J., Principal Medical Officer, R. Guernsey Mil.; Bentlif, Surg.-Lt.-Col. P. B., Med. Corps, Jersey Mil.; Bostock, Surg.-Capt. R. A., ret. Res. of Off., S. Gds.; Bradshaw, Fleet-Surg. F., R.N., ret.; Burton, Fleet-Surg. E. T., R.N.; Fawcett, Surg.-Gen. W. J., C.B., ret. pay; Gallwey, Surg.-Gen. Sir T. J., K.C.M.G., C.B.; Lauder, Surg.-Maj. R. E., Hampshire R.

THE NATIONAL SERVICE DEPARTMENT AND THE ORGANISATION OF THE MEDICAL PROFESSION FOR MILITARY AND CIVILIAN PURPOSES.

The following letter has been sent by the Director-General of National Service to the Central Medical War Committee, the Committee of Reference of the English Royal Colleges, and the Scottish Medical Service Emergency Committee:—

National Service Department, St. Ermin's, Westminster, S.W.,
Feb. 22nd, 1917

SIR,—The organisation of the medical profession with a view to meeting the needs both of the military and civil population is one with which this department is now concerned. Up to the present the work of providing the Army with qualified medical men has been undertaken by the Central Medical War Committee with the assistance of the Committee of Reference for England and Wales and the Scottish Medical Service Emergency Committee. It is clear, therefore, that in considering what further steps should be taken these bodies should be consulted and their opinions fully considered. Accordingly I have decided to call a conference, comprising three representatives of the Scottish Medical Service Emergency Committee, four from the Central Medical War Committee, and two from the Committee of Reference, over which I have asked Sir Donald MacAlister, the President of the General Medical Council, to preside, and I should be very much obliged if your Committee would be good enough to nominate representatives from amongst their number who would be prepared to attend. Particulars of the time and place at which the conference will be held will be arranged as soon as the names of all the representatives have been received.

The chairman will be furnished with terms of reference, but for your information I may say that the following will be among the subjects upon which it is desired that the conference should express an opinion: (1) Whether the service to be given by members of the profession should be compulsory or voluntary; (2) what arrangements should be made for the collection and distribution of fees or other form of remuneration in cases where doctors leave their own practices or take on the practices of others; (3) what arrangements should be made: (*a*) centrally and (*b*) locally for redistribution of medical men; and (4) what should be the relations between any central executive or advisory body representing the profession and this department.

I am, yours faithfully,
A. NEVILLE CHAMBERLAIN, Director-General.

SCOTTISH MEDICAL SERVICE EMERGENCY COMMITTEE.

At a conference held recently of the Committee and the secretaries of the Local War Committees for Scotland the following resolution was adopted unanimously:—

That this Conference of Secretaries of Local War Committees being informed that further substantial calls are likely to be made on the profession is of opinion that these calls can only be met by mobilising the whole profession.

THE "C" DISINFECTING FLUID.

The Medical Department of the Navy employed at Gallipoli a preparation known as the "C" disinfecting fluid, which under trial has proved so useful in prevention of the decomposition of carcasses that we cannot help wondering why more has not been heard of the invention and why its use has not become more general. The fluid was devised and standardised at the Pathological Laboratory at Cambridge, and the ideals set forth for it may be briefly summarised as follows: The preservation and deodorising of carcasses of animals and the prevention of the deposit of fly eggs, the destruction of fly maggots developed from eggs deposited before the application of the chemical, a fly deterrent, and a general deodoriser. In November of 1915 Fleet-Surgeon D. W. Hewitt, F.R.C.S., was instructed by Sir Arthur May, the Director-General, to investigate for the Medical Department of the Navy the results of the experiments which had been carried out at Cambridge during a period of six months, and the gist of his report showed that the fluid is a very active disinfector. The bodies of guinea-pigs, rabbits, goats, pigs, and horses had been exposed for various periods under conditions simulating those to be found in the actual zones of battle. They were grouped in three different areas separated by from two to three miles, presumably with the intention of negativing or minimising the influence of the soil, and they had all been exposed to open air, rain, and sunshine for periods varying from a fortnight to six or seven weeks. The fluid, the exact composition of which has not been made public—though it is, of course, known to Professor G. S. Graham-Smith, of the Pathological Laboratory at Cambridge—is a coal-tar preparation costing only 4½*d.* a gallon, and as it can be obtained in large quantities it may be used undiluted. This, indeed, is one of its notable advantages, as no skill is required for making dilutions. Two gallons suffice for treating a horse, and Fleet-Surgeon Hewitt suggests that probably one gallon poured over the clothing of a dead man would be ample to arrest putrefaction.

The methods of treatment of the various carcasses employed for experiment were described by Fleet-Surgeon Hewitt as threefold: the fluid can be brushed over the surface of the dead animal, or it can be injected into the carotid artery, or it can be introduced into openings made in the peritoneal and pleural cavities. Carcasses of different bulk were treated by each method, and were found to be deodorised, while putrefaction was greatly retarded or prevented and fly maggots were killed. The most effective technique was found to be the brushing over the surface of the carcass with the fluid, coupled with its injection into the carotid artery. The body of a horse treated in this way was perfectly fresh and odourless a fortnight later. Trenches and latrines when sprayed with the fluid were kept free from flies, which it kills as well as the maggots, and it prevents the ova from being deposited.

Professor Graham-Smith's Description.

The following is the routine as described by Professor Graham-Smith for the effective treatment of the carcass of a horse. The carcass should be injected through the carotid artery, using a pump delivering a quantity of "C" fluid from a container—the container used in the Cambridge experiments was the Excelsior 5970 (Benton and Stone, Limited, Birmingham). Two gallons of the fluid will be found sufficient for a horse weighing 1000 lb. The operation takes from 5 to 10 minutes. A further one gallon should be sprayed on the surface with a watering-can. The surface includes legs and feet, and both sides of the animal should be brushed in the direction of the hair which thoroughly distributes the fluid. More fluid should be poured in the ears, eyes, nostrils, mouth, anus, and any wounds. Patches of blood in the neighbourhood should be sprinkled. If the horse cannot be injected the abdomen should be opened in such a manner that the intestines do not fall out, and the intestines should be slashed so as to let out the gas. Then one gallon of the fluid should be poured in and more fluid should be poured into the pleural cavity through an opening between the ribs. Externally the treatment is the same as when the horse is injected, and a similar routine should be followed in dealing with a carcass already putrid, but if it is so offensive as to be unapproachable it can be sprayed at first from a distance. Treated in this way bodies will remain for days without any marked smell, and can be buried when time or opportunity permits. It is recommended that carcasses which are to be buried immediately should also be sprayed and the natural openings and any wounds also be injected, so as to prevent flies hatching out from the eggs which have been deposited.

Against flies, those ubiquitous disease-carriers in all warm zones, the "C" disinfecting fluid acts efficiently. Professor Graham-Smith says that treatment with the fluid will kill all maggots and will prevent flies from laying their eggs for some days, while even if the eggs are laid the maggots will not hatch out.

Flies can be prevented from entering a shelter, such as a dug-out, even if attractive baits are placed inside, by hanging a cloth sprayed with the solution over the entrance. Moreover, it has been found that the smells from putrefying carcasses or fæces are almost completely removed by the use of the fluid. The suggestion follows that probably flies could be kept from the trenches by spraying of the "C" fluid and from men's faces by anointing their caps. Professor Graham-Smith adds that at Cambridge there has not been any opportunity of carrying out experiments on fly-infested rooms, kitchens, and outhouses, but it can be assumed that by treating the floors, doors, and windows with "C" fluid most of the insects could be kept away from such premises and from horse-lines and latrines. The solution can be supplied at 4½*d.* per gallon in 40-gallon barrels or in 5 to 100-gallon drums, and Mr. F. W. Foreman, F.I.C., of the Cambridge Agricultural Department, who has been associated with Professor Graham-Smith in the work, says that 10 000 gallons could be supplied in a short time, and that the correct material will be supplied in response to orders sent through him. Mr. Foreman adds the following word of caution to men who are constantly using the solution. They should anoint their hands and arms with vaseline and should remember that contact with the fluid causes considerable local irritation to the mouth and eyes.

A Trial at the Dardanelles.

As the results of a trial of "C" fluid by a Royal Naval Division at the Dardanelles, Fleet-Surgeon Hewitt made a further report in which he pointed out that the specific gravity of "C" fluid caused difficulty in obtaining a spray which would throw satisfactorily for more than 20 or 30 yards. Spraying is, of course, not necessary when opportunity occurs for the more effective methods of brushing with the fluid or injection of the fluid into the body, but in the near neighbourhood of trenches corpses of men and animals, and other putrefying material, may lie for some days before any opportunity of other treatment than spraying can be found.

The report from the Dardanelles was made by Staff-Surgeon E. L. Atkinson, and forwarded with a confirmatory report by Fleet-Surgeon Arthur Gaskell.

The following extracts from Staff-Surgeon Atkinson's report will show the scope of the inquiry made:—

The body of a Turk killed eight days previously and buried three days in the parapet of a trench was exhumed. Decomposition was in full progress, the stench was terrible, and the carcass was covered with flies, which were breeding in it. The body was lying on its side, and was regarded as a typical case upon which to try the effect of the liquid. About one gallon of the liquid was squirted from a garden spray over the clothes and exposed parts on Oct. 9th, 1915. Some of the flies that were on the body were killed immediately, and the remainder repelled. The stench abated almost immediately. The corpse was left exposed as it was, and there had been a heavy thunderstorm on the previous night. It was not possible to turn it in the daytime because of sniping. On the 11th there was complete absence of smell, only a few flies settled on it for a short time. A further half-gallon was sprayed over it and again on the 12th; there was no smell or flies. The size of the body had markedly shrunken and the result was extremely satisfactory. Again, three or four bodies immediately behind the firing-line were sprayed from a short distance with the fluid. The men had been dead for some time and the smell in the trench from the bodies was very offensive. The smell was damped down entirely by the fluid.

"In trench warfare," says Staff-Surgeon Atkinson, "the use of this substance ought to be invaluable. So many dead are lying within reach of a strong spray from the trench, and these cannot be buried because they are between the enemy and ourselves. It will also certainly repel fly and their breeding in these bodies; also the effect seems to last over an appreciable time." He mentions the need for a forcible pump so as to project a long spray, and notes also the satisfactory use that can be made of the fluid in the deodorising of manure-heaps and latrines.

He summarises his investigations as follows:—1. The fluid is an excellent deodorant. 2. Its effect on decomposition lasts some time—in one very advanced case seven days under observation. 3. It kills flies by spraying them in clusters, and in sufficient quantity repels them for some days from settling on the place sprayed. 4. In dealing with manure spreading in layers and spraying daily would probably be useful.

Fleet-Surgeon Gaskell supplies notes on the trials of the fluid undertaken at the Dardanelles which support Staff-Surgeon Atkinson's conclusions, and adds a note of warning in respect of its extreme inflammability.

THE ARTIST AT THE FRONT.

The third instalment of drawings by Mr. Muirhead Bone, issued from the office of *Country Life*, under the title *The Western Front*, by Messrs. George Newnes, Ltd., contains several striking illustrations made in British munition works. Three drawings, entitled "The Gun-pit," show the hardening of the steel, a gun jacket entering the oil-tank, and the great crane which lifts the guns about from furnace to tank and from tank to lathe. They form a fitting introduction to a picture of a vast shell store entitled "The Hall of the Million Shells," and to another reproduced on the frontispiece, entitled "Mounting a Great Gun," wherein the horror of these enormous instruments of death is lost, unless it is accentuated by the serenity of their appearance, which comes of their perfect strength and symmetry.

Other notable drawings in this instalment, notable mainly because they enable us to realise what is really going on at the front, are "A Line of Tanks," "A Kitchen in the Field," a disembarkation scene, and "Thawing Out," which records in a lively manner the bitter cold to which the aviator has to submit. In the first plate, an illustration of the market square at Cassel, Mr. Muirhead Bone is at his best as a chronicler of the graces and spaces of an ancient city.

Obituary.

THOMAS SEYMOUR TUKE, M.A., M.B., B.CH. OXON.,

LECTURER ON MENTAL DISEASES AT ST. GEORGE'S HOSPITAL, LONDON.

WE much regret to announce the death, in his sixty-second year, of Dr. T. S. Tuke, who has fallen a victim to pneumonia following rapidly upon an apparently simple cold.

Thomas Seymour Tuke was the son of Dr. Harrington Tuke, who in the last generation was a leading consultant physician for mental disorders, and he was the grandson of the famous Dr. John Conolly, associated in this country with the abolition of mechanical restraint in the treatment of the insane. Young Tuke was educated at St. Paul's School and, winning a scholarship, proceeded to Brasenose College, Oxford, and later to St. George's Hospital. At school and college he developed the love of sport which remained with him throughout his life. He became a useful cricketer and a fine horseman as well as a good shot, and at St. George's Hospital he made a leisurely passage through his examinations and added to the already large number of personal friends which his kindness of heart, charm of manner, and love of games had acquired for him at school and college. It was not until after Tuke graduated in medicine at Oxford that he showed his real quality as a physician. Bred from his earliest years in association with the most humane treatment of mental sufferers, he rapidly developed into a skilful adviser. On the practical side of treatment he was especially helpful, and he had strong views as to the necessity of long training by residence with the insane for those who would dictate their treatment. He frequently insisted on the dangers which might follow on the existing fashion of placing insane patients in ordinary nursing homes or with inexperienced guardians, and he spoke from the full knowledge of his subject gained as co-licensee with his brother, Dr. Charles M. Tuke, of Chiswick House. Appointed lecturer on mental diseases at St. George's Hospital, his instruction to the students was always of a practical character; and, as a matter of fact, he conducted no original researches, but his general advice on matters connected with lunacy to those of the students who intended to become general practitioners was exactly what they required.

By the death of Dr. Tuke there is removed from among us one of the kindest and most sympathetic of men, who discharged his professional duties with the highest appreciation of their importance and delicacy. He married a daughter of the late Dr. Graily Hewitt, the well-known obstetric physician, in 1890, and his wife and daughter survive him. In THE LANCET of May 22nd, 1915, we announced the death in the war of his only son, Second Lieutenant A. H. S. Tuke.

Medical News.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At a meeting to-day (Friday, March 2nd), in the society's rooms at the West London Hospital, a paper will be read by Mr. Aslett Baldwin on "Some Mistakes in Diagnosis."

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee, held on Feb. 13th, 20 cases were considered and £162 granted to 15 of the applicants. Four of the applicants were elected to vacant annuities. The committee also decided to increase the number of annuities by 12. The following is a summary of the cases relieved:—

Widow, aged 40, of F.R.C.S. Eng. who practised in Rotherhithe and died in 1913. Applicant was left without means and decided to endeavour to earn a living by taking paying guests, and took a house in June 1914, on a three years' lease on the Kent coast. The prospects were bright, but the war stopped all visitors, and she has had the house on her hands and had to work as a nurse to pay the rent. The landlord will release her of her responsibility if she pays £10, so she wants the loan of that amount. One son is a foundation scholar at Epsom. Voted £10.—Widow, aged 42, of M.B., C.M. Glasg. who practised at Blackpool and died in 1911. Applicant was left without means with one daughter, aged 8 years. She went to America, and was able to earn a living for a time, but owing to her health breaking down she returned to England. At the present time her health is very bad, and the Glasgow branch of the Guild have provided her with a temporary home and are giving her invalid comforts. The daughter, now 14 years of age, is earning 8s. per week; this is the only income. Voted £12.—M.D. St. And., aged 72, and married. Was a missionary in India, and afterwards for many years practised in the City of London. Lost his practice through the premises he occupied being required for City improvements, and he was not properly compensated. Has recently had an hemiplegic attack and quite unable to work. Voted £5.—Daughter, aged 43, of L.R.C.P. Edin. who practised at Wymondham and died in 1882. Applicant was left entirely without means and went with her mother to France, where they acted as governesses. The mother died, and the applicant, who had never been strong, returned to England and tried to earn a living by teaching French and Spanish, but was not very successful. At the present time is in great poverty, and health very bad. Relieved twice, £7, in 1911. Voted £7.—Daughter, aged 57, of M.R.C.S Eng. who practised at Rotherhithe and died in 1879. Applicant suffers from chronic glaucoma, and before this earned a living as a nurse. Only income £24 from friends, and small investment. Relieved eight times, £79. Voted £12 in 12 instalments.—Widow, aged 70, of M.D. St. And. who practised at Kidderminster and died in 1884. Applicant was left with less than £50 per annum, and tries to supplement this by taking in lodgers, but owing to ill-health and age cannot continue to do this. Relieved twice, £22. Voted £12 in 12 instalments.—Widow, aged 69, of M.R.C.S. Eng. who practised in London and died in 1893. Applicant is a cripple, and only able to earn very little as an artist. She owns a house which is let, but owing to its being in such a bad state of repair practically all the rent goes in repairs. Relieved twice, £22. Voted £12 in 12 instalments.—Daughter, aged 60, of M.R.C.S. Eng. who practised at Box, Wilts, and died in 1894. Has two sisters who are invalids partly dependent on her. Only able to earn about 25s. a month as a companion. One of her sisters is helped by the Fund and the Guild. Relieved eight times with sister, £126, and self three times, £48. Voted £18 in 12 instalments.—Daughter, aged 43, of M.R.C.S. Eng., who practised at Scarborough and died in 1879. Was left without means, and owing to ill-health not able to earn sufficient by nursing to pay her way. Relieved 12 times, £117. Voted £10 in two instalments.—Daughter, aged 55, of F.R.C.S. Eng. who practised at Bedford and died in 1890. Applicant, whose health is very indifferent, earns a little in domestic service, but health will not permit her continuing in one place long. Has recently poisoned her thumb and is in great distress. At the request of the Guild visitor an emergency grant of £2 has been sent to her. Relieved 11 times, £88. Voted £12 in four instalments.—Widow, aged 50, of M.R.C.S. Eng. who practised at Hexham and London, and died in 1908. Was left entirely without means and endeavours to earn a living by taking in lodgers. Has one daughter, a teacher, who earns 22s. per week, and this is the only certain source of income. Relieved seven times, £84. Voted £12 in 12 instalments.—Wife, aged 50, of M.R.C.S. Eng., a Major in the R.A.M.C. She was deserted by her husband nine years ago and left with a delicate daughter now 29 years of age. Through the illness of her daughter, and the fact that her husband's allowance was stopped for 18 months, she has got into temporary financial difficulties, and owes for her removal expenses to her present home and for other items. Her prospects are good if she can obtain help now. Relieved twice, £20, in 1913. Voted £50 from Fund and Guild.—Daughter, aged 52, of M.R.C.S. Eng. who practised at St. Clears and died in 1878. Applicant suffers from double spinal curvature. Her mother is an annuitant of the Fund. Relieved three times, £18. Voted £6 in 12 instalments.—M.R.C.S. Eng., aged 49, who practised mainly in West Africa. He is totally incapacitated from work due to sunstroke and other trouble. Lives with an aunt whose means are very limited. A relative allows £24 a year. Relieved three times, £25, last £5 in June, 1916, with permission to apply again in six months. Voted £5.—Daughter, aged 69, of M.R.C.S. Eng. who practised at Battle, Sussex, and died in 1873. Lives with sister, who can only help her a little. Suffers from rheumatism and bad sight. Relieved 33 times, £266. Voted £12 in 12 instalments.—Widow, aged 48, of M.R.C.S. Eng. who practised at Deal and died in 1904. Only income £20 from dividends. Shares home with mother and sister whose means are limited. Unable to meet expenses owing to the high cost of food. Voted £10 in two instalments.

Subscriptions may be sent to the honorary treasurer, Dr. Samuel West, at 11, Chandos-street, Cavendish-square, London, W.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Legislation on Venereal Diseases.

IT is anticipated that a Bill dealing with certain matters in relation to venereal diseases will be introduced in the House of Commons at no distant date on behalf of the Local Government Board. The Criminal Law Amendment Bill, which is under the care of the Home Secretary, contains a clause imposing penalties on persons who knowingly communicate venereal disease to others. It was read a second time last week and was formally referred to "a Committee of the whole House." A suggestion was made that this decision should be rescinded and that the measure, along with the promised Bill of the Local Government Board, should be dealt with by a Grand Committee—that is, a committee on which selected Members of the House sit. The idea is that this course would secure continuity of outlook in dealing with the details of both measures. The Government has given its assent to this suggestion, and, so far as the Criminal Law Amendment Bill is concerned, a resolution has been passed which will have the effect of sending it to a Grand Committee for detailed consideration.

Use of Cocaine in Dentistry.

The Committee which has been considering questions with regard to the use of cocaine in dentistry, particularly by unregistered practitioners, has made its report to the Home

Secretary. Sir GEORGE CAVE has laid it on the table of the House of Commons. He intimates that the report raises some questions which will require consideration. He proposes for that reason to extend for two months the permit to unregistered practitioners in dentistry to use solutions containing not more than 1 per cent. of cocaine.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 21ST.

Medical Notes of Wounded Men.

Mr. SNOWDEN asked the Under Secretary for War what medical notes had been, or were now, sent with wounded men from Flanders; and whether arrangements would be made to permit a wounded man being accompanied by medical notes on his own case, and the details of treatment carried out, so as to avoid delay and unnecessary manipulation on his arrival in England.—Mr. MACPHERSON answered: Each man has attached to his coat a card giving particulars of the case. Improvements of this card are now being carried out and a fuller history of the case will be given.

THURSDAY, FEB. 22ND.

"Manipulative" Surgery.

Mr. MACVEAGH asked the Under Secretary for War whether the Army Medical Department was aware that the Medical Act of 1858 applied only to persons falsely styling themselves physicians, doctors of medicine or surgery, or surgeons; whether the department was also aware that experts in manipulative treatment did not come within any of those descriptions, did not so style themselves, and had never asked to be so employed; and whether he could state what section of the Act could, under those circumstances, be construed as preventing the department from using the services of these experts.—Mr. MACPHERSON wrote in reply: No, sir, I am not aware that my honourable friend's interpretation of the Medical Act is correct. I think if he refers to the Act he will find that it prohibits the appointment of any person as a medical officer unless he is registered. Every branch of medicine and surgery pursued by lawfully qualified medical men is represented amongst those employed by us.

Mr. MACVEAGH asked whether the Army Medical Department was yet in a position to say whether the British Medical Committee (Balneological Section) had reported on the use of manipulative treatment in France; and whether the Army Medical Department in this country proposed also to make use of every possible aid for wounded soldiers.—Mr. MACPHERSON replied: Yes, sir. They have reported on certain methods of treatment, all of which are in use in this country.

Answering further questions, Mr. MACPHERSON wrote: Any professional degree recognised by the law of the land is recognised by the Army Medical Service. The so-called manipulative treatment is in full swing in the Army under well-known authorities on the subject. My honourable friends who take an interest in the subject of manipulative treatment may rest assured that facilities for discussion will be afforded at an early date on the introduction of the Army Estimates.

Epileptics amongst Discharged Soldiers.

Answering Mr. KING, who asked a question bearing on the treatment of epileptics discharged from the Army, Sir A. GRIFFITH-BOSCAWEN (representing the Ministry of Pensions) wrote: The Minister of Pensions has no precise information as to the number of persons who have become epileptics subsequent to enlistment, but I am advised that it is not large. The treatment and training of epileptics is, however, being carefully considered. A scheme has been approved by the Statutory Committee for additions to the accommodation at Chalfont Colony, and a special joint committee on institutional treatment, who have secured the services of an expert medical man, are considering the further steps to be taken.

WEDNESDAY, FEB. 28TH.

Venereal Disease in the Army.

Answering Mr. KING, who asked for figures of cases of venereal diseases in the Army, Mr. MACPHERSON (Under Secretary for War) wrote: The present admission ratio for troops in the United Kingdom is 43·5 per 1000 per annum. This figure is a reduction on that furnished on Nov. 16th. In France the proportion is 24 per 1000.

The following journals, magazines, &c., have been received:—Journal of Anatomy, Maryland Medical Journal, Archives of Radiology and Electrotherapeutics, Surgery, Gynecology, and Obstetrics, American Journal of Syphilis, American Journal of Roentgenology, Bulletin of the Johns Hopkins Hospital, Medical Review of Reviews, American Journal of Public Health, Ellingwood's Therapeutist, Medical Times, Clinical Medicine, Pediatrics, Malaria, Psychoanalytic Review, American Journal of Obstetrics, Modern Hospital, American Journal of Medical Sciences, Journal of Mental Science, Military Surgeon, American Journal of Orthopedic Surgery.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

APPLECROSS, PARISH OF, ROSS-SHIRE.—Medical Officer, &c., for Torridon District. Estimated emoluments £350 per annum.

ASHTON-UNDER-LYNE, LANCS, DISTRICT INFIRMARY AND CHILDREN'S HOSPITAL.—Assistant House Surgeon. Salary £160 per annum, with usual emoluments.

BEDFORD COUNTY HOSPITAL.—House Physician, unmarried. Salary £150 per annum, with board, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL.—Female House Surgeon. Salary £200 per annum.

BIRMINGHAM CITY.—Assistant Tuberculosis Officer for West Heath Hospital and Assist at Anti-Tuberculosis Centre, Broad-street. Salary £350 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Surgeon. Salary £150 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURNLEY, VICTORIA HOSPITAL.—House Surgeon. Salary £160 per annum, with board, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

CAMBRIDGE, COUNTY MENTAL HOSPITAL.—First Assistant Medical Officer. Also Junior (Second) Assistant Medical Officer, unmarried. Salaries £300 and £200 respectively, with board, &c.

DUNDEE DISTRICT ASYLUM.—Assistant Resident Medical Officer. Salary £300 per annum, with board, &c.

GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon. Salary £200 per annum, with board, &c.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.—Assistant Casualty Medical Officer. Salary at rate of £60 per annum, with board, &c.

LONDON COUNTY COUNCIL.—Two Female Medical Inspectors (unmarried or widows) in the Public Health Department. Salary £300 a year.

MANCHESTER, ABERCELE SANATORIUM.—Temporary Medical Superintendent. Salary £300 per annum, &c.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—House Surgeon. Salary £120 per annum, with board, &c.

NEWCASTLE UPON-TYNE EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £300 per annum.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—House Surgeon.

SALFORD ROYAL HOSPITAL.—Junior House Surgeon. Salary at rate £150 per annum, with board, &c.

SOUTHAMPTON PARISH INFIRMARY, Shirley Warren.—Resident Assistant Medical Officer. Salary £250 per annum, with apartments, &c.

SOUTHAMPTON, ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—House Physician and Junior House Surgeon. Salaries £150 and £120 per annum respectively, with board, &c.

SUNDERLAND ROYAL INFIRMARY.—Female House Surgeons. Salaries—Senior, £250; Junior, £200 per annum, with board, &c.

WEST HAM UNION SICK HOME, 95, Forest-lane, Forest Gate, E.—Resident Assistant Medical Officer. Salary £300 per annum, &c.

WINCHESTER, ROYAL HAMPSHIRE COUNTY HOSPITAL.—Resident Medical Officer. Salary as arranged, with board, &c.

Births, Marriages, and Deaths.

BIRTHS.

ASH.—On Feb. 21st, at The Lodge, Brampton grove, Hendon, to the wife of Dr. Edwin Ash (of Harley-street, W.)—a son.

KENNEDY.—On Feb. 18th, in London, the wife of Captain Charles M. Kennedy, R.A.M.C., of a son.

MURRAY.—On Feb. 25th, at 95, Cadogan-gardens, W., the wife of W. Murray, M.B., D.P.H., of a son.

MARRIAGES.

LAMBERT—LOCKHART.—On Feb. 22nd, at St. Martin's by Looe, Cornwall, by the Rev. W. S. Picken, M.A., Surgeon John Lambert, M.D., R.N., eldest son of the late John Lambert, of Cambridge, to Alice Margaret, fifth daughter of the late James Lockhart, The Elms, Kirkcaldy.

MAYBERRY—HESLOP.—On Feb. 20th, at St. Mary's Church, St. Ives, Cornwall, George Mahony Mayberry, Temporary Captain, R.A.M.C., to Lily, eldest daughter of the late William Heslop.

DEATHS.

FORSTER.—On Feb. 11th, of heart failure following influenza, while in charge of a hospital at Zaleszczyki, Galicia, Dr. Laura Forster.

MCKELLAR.—On Feb. 20th, at 10, Crondace-road, Fulham, Peter Hugh Montgomerie McKellar, M.A., M.B., C.M. Glasg., aged 72.

TUKE.—On Feb. 23rd, at Chiswick House, Chiswick, W., from pneumonia after a short illness, Thomas Seymour Tuke, M.A., M.B. Oxon, aged 61.

WEBER.—On Nov. 20th, at Georgetown, British Guiana, Hubert Clinton Weber, M.D. Edin., aged 34.

WILLIAMSON.—On Feb. 21st, at Durley, Camberley, Deputy Surgeon-General Benjamin Williamson, I.M.S., retired, aged 83 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

PUBLIC HEALTH IN BRITISH GUIANA.

A REPORT prepared by Mr. E. W. Ball Greene, Acting Assistant Secretary, on the affairs of British Guiana for the year 1915, has been presented to Parliament. From it we gather that the Registrar-General's estimate of the population of the colony on Dec. 31st, 1915, was 312,391 (162,403 males and 149,988 females). The general birth-rate for 1915 was 31·3 per 1000 of the estimated population, that of each of the several races representing the community being as follows: Portuguese, 20·5; Europeans other than Portuguese, 12·9; East Indians, 32·6; Chinese, 30·6; Blacks, 29·5; Mixed Races, 33·9. Of the births registered 44·5 per cent. were legitimate and 55·5 per cent. illegitimate. The general death-rate was 27·7 per 1000, that of the various races being: Portuguese, 28·0; Europeans other than Portuguese, 11·6; East Indians, 28·8; Chinese, 25·9; Blacks, 28·4; Mixed Races, 20·5. The six principal causes of death throughout the colony during the past five years are given as follows: Bowel complaints (including dysentery, diarrhœa, and enteritis), 15·4 per cent. of the general mortality; fevers (malarial and others), 14·6; pneumonia and bronchitis, 11·4; kidney diseases, 8·8; diseases of early infancy (including premature birth, infantile debility, &c.), 8·0; and phthisis and other forms of tuberculosis, 5·7 per cent. Enteric fever is a notifiable disease; during 1915, 419 cases were notified with 75 deaths. Anti-malaria and anti-mosquito measures are being generally and gradually enforced with visible signs of success. The number of screened vats in the city of Georgetown has increased as a result of the screening regulations being enforced. In 1906-7 33,748 cases of malarial fever were treated in the sugar estates' hospitals; in 1915 the numbers had fallen to 11,788. Quinine has been for some years sold at all post-offices to the general public at cost price. It is also distributed by the sugar estates free to their labourers, and by the Government to prisoners, members of the police force, and inmates and attendants at the public institutions. Ankylostomiasis, which has engaged the attention of the medical department for several years, has considerably decreased on the sugar estates; this is attributed to improved sanitary measures and the erection of latrines.

There are five public hospitals in the principal centres of population, and the outlying districts are served by dispensary hospitals and dispensaries. The immigration law also requires the maintenance of hospitals on every plantation on which there are indentured East Indian labourers, and these institutions are available for the treatment of emergency and pauper cases from the general community. There were 434 patients in the public hospitals at the beginning of the year and 11,304 were admitted during the year; there were 1399 deaths. In addition to those admitted to hospital, out-door treatment was given to 37,574 persons. The daily average of inmates in the lunatic asylum was 775; 75 were discharged cured during the year and 74 died. At the leper asylum there were 381 patients when the year began (265 males and 116 females) and during the year 44 were admitted.

POTATOES.

THERE have been several references lately in the newspapers to forcing the growth of potatoes, and the suggestion has been made of placing the seed potatoes in shallow boxes in a warm place before planting out. This suggestion, though apparently novel, is at least 20 years old, as the Rhode Island Agricultural Station in the United States then published a bulletin giving the results of experiments made by planting potatoes in pots in a greenhouse and transplanting them out of doors. Another method was to expose small potatoes as large as hen's eggs to heat and light for six weeks, to develop a strong bud and roots before planting them. Both plans gave a better yield, especially the last, which resulted in a gain of 32 bushels per acre. The acreage under potatoes in the United States has steadily grown. The figures nine years ago had reached 3,257,000 acres, producing 278,985,000 bushels, or an average of 85·7 bushels per acre, with a farm value of 197,039,000 dollars; an average price of cents 70·6 per bushel. 52 bushels equal 189 dekalitres. The main crop goes under the name of "Irish potatoes," but there is also a crop of 60 million bushels of "sweet potatoes." This is the esculent root of the *Ipomœa batatas*, or *Batatas edulis* or *Convolvulus batatas* much eaten in the United States. In Peru it is called *camote;* in Cuba *boniato;* in Spain *batata de Malaga;* in other countries Spanish or Indian potatoes. It is the spindle-shaped tuber of a species of convolvulus, and is said to have been used for food before the common potato was eaten. It contains 16 per cent. of starch and 10 per cent. of sugar. This is the "potato" referred to by early writers, and Shakespeare in *Troilus and Cressida* refers to the "potato finger," meaning a long thick finger. Sweet potatoes require a warm climate. In England they were introduced from Spain and the Canaries, but potato-growing was not encouraged in England in the Stuart times, and even so late as early Victorian days some political economists thought the "potato rot" might be a blessing if it taught the working classes not to rely upon potatoes but to seek better food. In contrast to this our Royal Society in 1663 took some measures for encouraging the cultivation of potatoes with the view of prevention of famine.

VITAL STATISTICS OF BERMUDA.

Lieutenant-General Sir G. M. Bullock, K.C.B., Governor of Bermuda, has forwarded to the Colonial Office a report on the Blue-book for 1915, from which it appears that at the end of the year the estimated total civilian population was 20,801, composed of 7219 whites and 13,582 coloured. The birth-rate for the year was 22·16 per 1000 among white residents and 35·59 among coloured residents. The death-rate was 13·85 per 1000 among white resident civilians and 18·18 among the coloured. The mortality among children under 5 years of age was 31·2 per cent. (10·27 whites and 39·67 coloured) of the total deaths. The deaths from cancer numbered 18 and those due to tuberculosis 33. No outbreak of serious infectious disease occurred during the year. The mean temperature of the air for the year was 69·8° F. and the total rainfall 61·8 inches. There is no hospital maintained by the Colonial Government, but the King Edward VII. Memorial Hospital is expected to be ready for occupation early in 1917. There is a cottage hospital near the city of Hamilton which is supported by voluntary contributions, and hospitals are also maintained in connexion with the Imperial naval and military establishments. The number of visitors to the colony in 1915 was only 10,831, as compared with 14,773 in 1914 and 21,595 in 1913, the decrease being attributed to the dislocation of the steamship service with New York owing to the war.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY.—Papers:—Mr. W. B. Bottomley: Some Effects of Growth-promoting Substances (Auximones) on the Growth of Lemna minor in Culture Solutions (communicated by Prof. F. W. Oliver).—Florence A. Mockeridge: Some Effects of Growth-promoting Substances (Auximones) on the Soil Organisms concerned in the Nitrogen Cycle (communicated by Prof. F. W. Oliver).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Thursday, March 8th.

BALNEOLOGY AND CLIMATOLOGY (Hon. Secretaries—Chas. W. Buckley, J. Campbell McClure): at 5.30 P.M.

Demonstration

Of Mensuration Apparatus in use at the Red Cross Clinic for the Physical Treatment of Officers, 126, Great Portland-street, W. (with cases).

Paper:

Mr. J. Roddie: Manipulation Bath. (Communicated by Dr. J Campbell McClure.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY.—5 P.M., Hunterian Lecture:—Major A. E. Webb-Johnson, R.A.M.C.: The Surgical Complications of Typhoid and Paratyphoid Fevers.

ROYAL COLLEGE OF PHYSICIANS, EDINBURGH, Hall of the College, Nine Queen-street.

MONDAY.—5 P.M., Morison Lectures:—Dr. E. Bramwell: Neurology of the War—Gunshot Wounds of the Peripheral Nerves. (Lecture I.)

FRIDAY.—5 P.M., Morison Lectures:—Dr. E. Bramwell: Neurology of the War—Shell Shock and the Effects of Head Injuries. (Lecture II.)

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Perget: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. B. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham); Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. B. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.

THURSDAY.—5.15 P.M., Clinical Lecture.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.

TUESDAY.—6 P.M., Dr. K. Sibley: Ionisation. Electrolysis.

WEDNESDAY.—5 P.M., Dr. W. Griffith: The Pathology of Diseases of the Skin.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture VIII.:—Prof. F. G. Hopkins: The Selection and Preparation of Foods in War Time. Prof. D. N. Paton, Prof. W. H. Thompson, Dr. M. S. Pembrey, Dr. A. W. J. MacFadden, and Dr. W. J. Howarth have promised to take part in the discussion.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W

MONDAY.—5 P.M., General Meeting.

THURSDAY.—3 P.M., Prof. A. Denny: Sponges: a Study in Evolutionary Biology. (Lecture I.)

FRIDAY.—5.30 P.M., Sir Almroth Wright, C.B.: The Treatment of Wounds in War.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Feb. 28th, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
Feb. 22	...	46	41	39	39	39	Overcast
,, 23	...	56	45	39	38	39	Fine
,, 24	0·10	52	46	39	43	43	Fine
,, 25	...	57	47	42	42	42	Overcast
,, 26	0·01	73	49	36	37	38	Fine
,, 27	...	64	49	36	37	37	Overcast
,, 28	...	60	47	37	39	42	Overcast

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C.

MANAGER'S NOTICES.

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